

ISSN 2394-806X (Print)
ISSN 2454-5139 (Electronic)
Volume:04/ No:02 /July, 2018

International Journal of Health Research and Medico Legal Practice

A Multidisciplinary International Indexed Journal



www.ijhrmlp.org

Editor in Chief
Putul Mahanta

Abstracting and Indexing:



ADVANCED SCIENCE INDEX





Delegate' Queue at Registration Desk of National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018



Delegates Attending the National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018



Inauguration of the National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018



Editorial Board

WEB EDITORS

Prof. **Adarsh Kumar** MD PGCHM Double Commonwealth Fellow UK FRSM FIAMLE, Professor of Forensic Medicine and Toxicology, AIIMS, New Delhi, India
Dr. **Amitabh Lahkar** MD (Anesthesia) Fellow of Obstetric Anesthesia Specialty Doctor, Anaesthetics Milton Keynes NHS Foundation Trust, Milton Keynes, Buckinghamshire, UK
Dr. **Dhiraj Baruah** MD PDCC Medical Director, Emergency Radiology Assistant Prof. of Diagnostic Radiology Medical College of Wisconsin, Milwaukee, USA

CO-EDITORS

Dr. **Narendra N Ganguly** MS PhD, Assam
Prof. **Hemonta Kr. Dutta** MS MCh, Assam
Prof. **Rubi Kataki** MDS PhD, Assam
Prof. **Vijayanath** MD DNB, Tamil Nadu
Prof. **Gunajit Das** MD, Silchar, Assam
Prof. **KK Bairagi** MD, Uttarakhand
Prof. **Manish Nigam** MD LLM, MP
Dr. **Dilip Goswami** MDS PhD, Assam
Dr. **Junu Devi** MD, PhD, Assam
Dr. **Deepjyoti Kalita** MD PhD, Uttarakhand
Dr. **Chandana Kalita** MDS PhD, Assam
Dr. **Purnima Barua** MD, Jorhat, Assam
Dr. **Dhirendra Singh Yadav** PhD, Bhopal

INTERNATIONAL ADVISORY BOARD

Prof. **Tracey Wilkinson** Dundee, Scotland UK
Prof. **Khaled M Gdarah** Tripoli, Libya
Prof. **Abdulwahab Ali Abuderman** Saudi Arabia
Prof. **Clifford Pareira**, Sri Lanka
Prof. **Hisataka Shoji**, Japan
Prof. **Dina Ali Shokry**, Egypt
Prof. **BN Yadav**, Nepal
Dr. **Himanshu Pandey**, Australia
Dr. **Rahul Pathak**, Cambridge, UK
Dr. **Pavan Kumar**, Malaysia
Dr. **Sangeeta Pathak**, Hintington, Cambridgeshire
Prof. **Leandro Duarte de Carvalho**, Brazil
Dr. **LN Seetohul**, Nottinghamshire UK

EDITOR-IN-CHIEF

Dr. **Putul Mahanta** MD FIAMLE FICFMT
Associate Professor, Forensic Medicine and Toxicology
Tezpur Medical College, Tezpur, Assam, India
Email: editor@ijhrmlp.org

MANAGING EDITORS

Prof. **AJ Patowary** MD FNFCFM
Professor, Forensic Medicine and Toxicology
NEIGRIHMS, Shillong, Meghalaya, India
Prof. **Anku Moni Saikia** MD
Professor, Community Medicine
Gauhati Medical College and Hospital, Guwahati, Assam, India
Prof. **Anirban Hom Choudhuri** MD PGDMLE
Professor, Anesthesia and Intensive Care
GB Pant Hospital, New Delhi, India
Prof. **Dipak Kumar Sarma** MS FAIS FICS FIAGES FMAS
Professor of Surgery and Head Emergency Medicine
Gauhati Medical College and Hospital, Gauhati, Assam, India
Prof. **Hani Jahshan** MD
Senior Consultant Forensic Pathologist
Royal Medical Services, Bahrain Defense Force
Prof. **Karuna Hazarika** DMRD MD
Professor, Radio Diagnosis
Tezpur Medical College, Tezpur, Assam, India
Dr. **Kahua Das Thakuria** MD
Assistant Professor of Physiology
Tezpur Medical College, Tezpur, Assam, India
Prof. (DR.) **Krishna Das** PhD
Professor and Head Pediatric Nursing
Regional College of Nursing, Guwahati, Assam, India
Prof. **Mukesh Yadav** MD MBA (HCA) LLB PGDHR PGDHOQM FICFMT
Editor, IJFMT, Ex-Editor, JIAFM
Principal, Govt. Allopathic Medical College, Banda, UP, India
Prof. **Nirmal Ch. Bhattacharyya** MS MCh
Former Professor of Paediatric Surgery cum Principal cum Chief Superintendent
Tezpur Medical College and Hospital, Tezpur, Assam, India
Dr. **Nilakshi Mahanta** MD
Associate Professor, Department of Medicine
Gauhati Medical College, Guwahati, Assam, India
Prof. **RK Gorea** MD MBA PhD DNB
Principal NC Medical College and Hospital
Panipat Rohtak Road, Israna, Haryana
Dr. **Rup Sekhar Deka** MBBS LLB MD PhD
Associate Professor of Anatomy
Gauhati Medical College, Guwahati, Assam, India
Dr. **Sasanka Kumar Barua** MS MCh
Associate Professor of Urology and Renal Transplantation
Gauhati Medical College and Hospital, Guwahati, Assam, India
Dr. **Shyamanta Das** MD
Assistant Professor of Psychiatry
Gauhati Medical College, Guwahati, Assam, India
Prof. **Tahar Abdulaziz Suliman** MD PhD
Professor Faculty of Medicine
Head of Forensic Medicine and Toxicology, Zawia University, Libya



IJHRMLP

INTERNATIONAL JOURNAL OF HEALTH RESEARCH AND MEDICO LEGAL PRACTICE

Volume: 04, No: 02 (July, 2018)

Registration No. RS/KAM/240/K/232 of 2000-2001

AIMS AND SCOPE

Welcome to the "International Journal of Health Research and Medico Legal Practice (IJHRMLP)". IJHRMLP is published by NECHURD six monthly in January and July every year and a peer-reviewed multidisciplinary indexed journal. The journal has been assigned international standard serial number (ISSN) for both print (ISSN 2394-806X) and electronic (ISSN 2454-5139) version.

IJHRMLP is indexed in **ROAD** (the directory of open access scholarly resources which is a service offered by the ISSN International Centre with the support of the communication and information sector of UNESCO), **Index Copernicus** (2016 Act. Meth.), **Electronic Journal Library**, **Engineering academicskeys.com**, **Infobase Index**, **Academic Research Index (Researchbib)**, **journal-metrics.com**, **Indian Science**, **Researchers ID**, **Directory of Science**, **Yeollobrowser**, **Google Scholar**, **Scientific World Index**, **IJIF** and many more. The journal is **DOI** indexed with **Crossref** and Plagiarized checked by e-authentic.

IJHRMLP is dedicated to the up-gradation of health sciences and related disciplines (including medicine and its allied subjects; surgery and its allied subjects; Pre and Para-clinical subjects; Dentistry; Ayurveda; Pharmacy; Nursing; Biotechnology; Cell and molecular biology; and related public health fields).

MISSION STATEMENT

The IJHRMLP pursues exceptionally to inspire multidisciplinary research and collaboration among experts, the industry and the healthcare specialists. It also provides an international forum for the communication and assessment of data, methods and findings in health sciences and linked disciplines. The journal publishes original research papers, reviews, clarifications and case reports on current topics of special interest and significance and international health news. All manuscripts are subjected to rapid peer-review and only those of high quality are published without any delay.

COPYRIGHT

The views and opinions expressed in this journal are solely those of the original contributor(s)/ author(s) and do not necessarily represent those of editor(s) of the journal. All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission in writing of the editor-in-chief.

All brand names and product names used in this journal are trade names, service marks, trademarks or registered trademarks of their respective owners. The editor is not associated with any product or vendor mentioned in this journal. Medical knowledge and practice change constantly. This journal is designed to provide accurate, authoritative information about the subject matter in question. However, readers are advised to check the most current information available on procedures included and check information from the manufacturer of each product to be administered, to verify the recommended dose, formula, method and duration of administration, adverse effects and contraindications.

It is the responsibility of the doctor to take all appropriate safety precautions. Neither the publisher nor the author(s)/editor(s) assume any liability for any injury and/or damage to persons or property arising from or related to use of material in this journal. Every effort has been made where necessary to contact holders of copyright to obtain permission to reproduce copyright material. If any has been inadvertently overlooked, the publisher will be pleased to make the necessary arrangements at the first opportunity.

Registered Publisher Address:

NECHURD, H/N-1, Karmabir Bordoloi Path, Wireless, Rukmini Nagar, Dispur, Guwahati, Pin-781006, Assam, India
Email: hrmlpractice2014@gmail.com

CONTENTS

EDITORIAL

End-of-life care: 'Do not resuscitate', 'Do not intubate' and 'Allow natural death'

Mahanta Putul 01-02

ORIGINAL PAPER

A clinical study of peripheral vascular diseases in type 2 diabetes mellitus

Bhattacharyya Dipen K, Bhattacharyya Dipak K, Barua Swaroop K, Nath Sivam RK 03-05

Aerobic bacteriological profile with antibiogram of pus isolates in a tertiary care hospital

Mayengbam Sonita, Laifangbam Supriya, Singh Huidrom Lokhendro 06-10

Clinical and radiological profile of stroke in children

Das Marami, Santosh H, Basumatary Lakshya J, Goswami Munindra, Bezboruah Gayatri, Kayal Ashok K 11-16

A study of sex determination from human patellae in a tertiary care centre

Panja Saumabrata, Sardar Tanmay, Bose TK, Roy DG 17-21

To evaluate knowledge and awareness of consent in medical practice amongst the medical practitioner

Wankhade Pawan A, Ninanve Sudhir V, Mohite Prakash M, Patond Swapnil K 22-26

Effectiveness of information booklet on knowledge regarding acute respiratory infection among mothers

Hijam Sonia, Dutta Arunjyoti 27-30

Prevalence and correlates of dementia among the community-dwelling elderly of Guwahati City, Assam

Saikia AM, Mahanta Neelakshi, Mahanta Ajaya, Deka Himamoni, Boruah Beeva 31-34

Prevalence of risk factors of coronary heart disease amongst MBBS students of Gauhati Medical College

Saikia AK, Rajendran Vinoth 35-39

Impact of adverse drug reactions on quality of life in patients with schizophrenia

Chakravarty Pinaki, Neog Parthajyoti, Roy Dolly 40-44

Assessment of childrearing practices among tribal and nontribal women

Borah Kobita, Talukdar KL, Deka Rup Sekhar, Bhuyan Hemeswari 45-49

Predictors of falls and falls-related injury in elderly with mild cognitive impairment

Saikia AK, Das AK, Goswami Kumaril 50-52

Histopathological study of carcinoma stomach in Assam

Baruah Sampri, Talukdar Leena, Bhattacharjee SS, Das Mili, Chaubey Jyoti, Saharia Jahnabi, Dutta Debashis 53-57

Emotional problems and coping strategies of senior citizens

Sarma Krishnakshi, Bhuyan Hemeswari, Saikia Kaberi 58-62

Tila taila as sneha abhyanga in Sandhigatavata for swelling to prove the theory "Snehat Vatam Smayati"

Kalita Upen, Deka Himamoni, Barman Niten 63-65

Pattern of death in unknown bodies at a tertiary healthcare centre

Chikhalkar Bhalchandra G, Nadkarni Nitish A, Chavan Gajanan S, Nanandkar SD 66-70

Open cholecystectomy versus laparoscopic cholecystectomy: a comparative study

Kumar PC, Naseem Fraz 71-75

Adult community-acquired pneumonia in a tertiary care teaching hospital of Assam: a hospital based study

Kalita Deepjyoti, Deka Sangeeta, Hazarika NK 76-80

Role of viruddha ahara as causative factor in vicarcika in relation to IgE and AEC level

Choudhury Burhanuddin, Kalita Upen, Deka Himamoni 81-84

Profile and knowledge of blood donors: a study in a blood bank of a tertiary care centre

Bhattacharjee Ajanta, Thakuria KD, Mahanta Putul 85-87

Physicians' knowledge and patients' understanding of informed consent: challenges in clinical practice

Kumar Manisha, Asmita, Bhavya HU 88-92

Undergraduate medical students' knowledge about principles of research and publications

Debbarma Antara, Mahanta Putul, Thakuria KD 93-95

CASE REPORT

Acrania with placental adhesion: a case report

Bhattacharyya Nirmal C 96-98

A synonym to healing for perforation repair-MTA

Shekawat Krutika, Bora Proxima, Kataki Rubi, Bhuyan AC 99-101

Candida parapsilosis infection in a non-healing skin ulcer

Das Angshurekha, Barua Purnima, Patir Jayanta, Shivaprakash RM 102-104

An unusual case of cardiac tamponade due to rupture of ascending aorta in a young adult

Debbarma Antara, Yadav Abhishek, Kanwar Hemant K, Dey Arjit, Gupta Sudhir K 105-107

Silicone finger prosthesis: bracing back the life

Trivedi Hina, Barman Jogeswar 108-110

INTERNATIONAL JOURNAL OF HEALTH RESEARCH AND MEDICO LEGAL PRACTICE

MEMBERS OF THE INTERNATIONAL ADVISORY BOARD

Prof. **Ajaya Mahanta** MD, DM, Assam
 Prof. **TD Dogra** MD, Gurgaon, Haryana
 Prof. **PC Sarmah** MD LLB FICFMT FIAFM, Assam
 Prof. **KL Talukdar** MD, Assam
 Dr. **Jayanta Bordoloi** Assam
 Prof. **Anup Kr. Barman** MD DM, Assam
 Prof. **SD Nanandkar** MD, Maharashtra
 Prof. **Shiv Kochar** MD, Rajasthan
 Prof. **HK Mahanta** MD, Tezpur, Assam
 Prof. **Gokul Ch. Das** MD, Guwahati, Assam
 Prof. **Rajendra Kr. Kalita** MD (Ophth.) MD (Physiol.)
 Prof. **Debajit Hazarika** MD, Assam
 Prof. **Dalbir Singh** MD, Chandigarh
 Prof. **TK Bose** MD FIAFM, Kolkata
 Prof. **Sanjoy Das** MD, Dehradun
 Prof. **Satish Kr. Verma** MD WHO Fellow, New Delhi
 Prof. **Shilpi Rani Barman** MD, Silchar, Assam

Prof. **CB Jani** MD (Patho) MD & DNB (FMT), Ahmedabad
 Prof. **Kailash Bhattacharyya** MD, Assam
 Prof. **Atindra Kumar Adhikari** MD, Assam
 Prof. **Biraj Das** MS, Assam
 Prof. **KC Das** MD, Assam
 Prof. **Prabir Kr. Dev** MD, Kolkata
 Prof. **Dinesh K Badyal MD, Dip (Clin Research) Ludhiana**
 Prof. **NK Aggarwal** MD WHO Fellow, New Delhi
 Prof. **Pooja Rastogi** MD, Noida, Uttar Pradesh
 Prof. **Ajaya Mahanta** MD, DM, Assam
 Prof. **Dipali C. Deka** MS, Assam
 Prof. **BK Roy** MDS FICD, Assam
 Prof. **P. Mukhopadhyay** MD, Burdwan, Kolkata
 Prof. **Manoj Kr. Choudhury** MD, Assam
 Prof. **Dasari Harish** MD, Chandigarh
 Prof. **BK Baishya** MS, MCh Assam
 Prof. **Joydeb Sarma** MS, Assam
 Prof. **Kaberi Saikia** M.Sc (Nursing), PhD.

PEER REVIEW MEMBERS

Dr. **Pranab J Bhattacharyya** MD DM (Cardiology), Assam
 Dr. **KH Reeta** MD (Pharmacology), New Delhi
 Dr. **Aboelyazied Ahmed Fouad** MD, Kingdom of Saudi Arabia
 Dr. **Ashok Kumar Das** MS (Surgery), Barpeta
 Dr. **Deepanjali Medhi** MD (Psychiatry), Guwahati, Assam
 Dr. **Chaithra V** MDS (Public Health Dentistry), Karnataka
 Dr. **Neelutpal Bora** MDS (Ortho), Dibrugarh, Assam
 Dr. **Pooja Malik Puri** BDS, MSc (Forensic Science), Noida
 Dr. **Anindita Medhi** MD (Dermatology), Kuwait
 Dr. **Supriya Laifangbam** MD (Microbiology), Imphal
 Dr. **Rituja Sharma** LLM PGDCL PhD, Jaipur
 Dr. **Chinmoy Das** MS (Orthopaedic), Tezpur, Assam
 Dr. **Dilip Goswami** BAMS MD (AYU) (UTKAL), Assam
 Dr. **Neena Nath** MD (Medicine), Tezpur, Assam
 Dr. **Himamoni Deka** MD PhD PGDGM (Anatomy), Assam
 Dr. **Anjol Saikia** MD (Anesthesiology), Kuwait

Dr. **Khan Amir Maroof** MD (Community Medicine), Delhi
 Dr. **YN Singh** MD (Forensic Medicine), Silchar, Assam
 Dr. **Antara Deb Barma** MD (Forensic Medicine), New Delhi
 Dr. **Priyam Saikia** MD (Anaesthesiology), Guwahati
 Dr. **Keshab Bora** MD (Biochemistry), Dibrugarh, Assam
 Dr. **Abhishek Das** MD (Forensic Medicine), Kolkata
 Dr. **Gojendra Senjam** MD (Psychiatry), Imphal
 Dr. **Pranab Jyoti Mahanta** MD DM (Nephrology), Assam
 Dr. **Soumeek Chowdhuri** MD (Forensic Medicine), Kolkata
 Dr. **Lakshmi S Das** DA (Anaesthesiology), IDCCM, Assam
 Dr. **Rupam Borgohain** MS (ENT), Tezpur, Assam
 Dr. **Shobhana Medhi** MD (Anatomy), Guwahati, Assam
 Dr. **Jayanta Thakuria** MS (Ophthalmology), Assam
 Dr. **Bhaskar Jyoti Dutta** MD (Pharmacology), Assam
 Dr. **Jahnabi Baruah** MD (Biochemistry), Tezpur, Assam
 Dr. **Aditya Madhab Baruah** MD (Forensic Medicine), Assam
 Dr. **Arunjyoti Dutta** (MSc Nursing), Assam
 Dr. **Dharmakanta Kumbhakar** MD (Path), Assam

IJHRMLP STATISTICIAN

Dr. **Hiranya Saikia** M.Sc., M.Phil, Ph.D.
 Lecturer, Department of Community Medicine, Assam Medical College, Dibrugarh, Assam

JOURNAL OFFICE

H/N-1, Karmabir Bordoloi Path, Wireless, Rukmini Nagar, Dispur-06, Assam, India

EDITORIAL

End-of-life care: 'do not resuscitate', 'Do not intubate' and 'Allow natural death'

Mahanta Putul*

One of the critical choices that a patient or their legal guardian may have to make after knowing that comfort is now the goal of care is whether or not there should be any attempts to revive their patient if and when the vital organs stops.

DO NOT RESUSCITATE (DNR) ORDER

DNR order relates to circumstances where a patient has a cardiorespiratory arrest and no vigorous cardiopulmonary resuscitation (CPR), i.e., chest compressions, cardiac drugs, or placement of a breathing tube is given.

This DNR order is a well-documented and accepted concept in most of the developed countries. Here, nearly 15% of patients with DNR orders have undergone surgical procedures, including tracheostomy, gastrostomy and central venous catheter insertion.¹ In 1993, the **American Society of Anaesthesiologists** adopted guidelines for the anaesthesia care of patients with DNR orders, as well as other directives that limit the care. These were subsequently updated and emphasise the importance of the autonomy of the patient and shared decision making between patients and clinicians about the limitations of treatment in the operating room.² The **Limited Aggressive Therapy Order**, evolved in 2003, offers the patient the option of giving consent for cardiopulmonary resuscitation, particularly in situations in which a response has a higher rate of success, such as a witnessed cardiopulmonary arrest.³

DNR orders are usually established by competent patients or appropriate surrogates to provide a mechanism for withholding precise resuscitative therapies in the event of needs. It is important for health care institutions to develop policies to deal with DNR orders in the setting of anaesthesia and surgery.⁴ The frequency of DNR orders is increasing as the people are better informed about the **Patient Self-Determination Act** and **Advanced Directives**.⁵

Several surveys on these issues have documented confusion on the part of individual practitioners and have demonstrated that only a small percentage of institutions have specific policies regarding perioperative DNR orders.⁶⁻⁹

DO NOT INTUBATE (DNI) ORDER

DNI order means that chest compressions and cardiac drugs may be given, but no breathing tube will be placed. While a

patient request for a “Do Not Resuscitate order”, doctor may ask whether or not he or she wants a “Do Not Intubate” wish. The two terms are separate because the patient may have trouble breathing before heartbeat or breathing stops. If the breathing problems continue, the heart or lungs may go into full arrest. Intubation, however, may avert cardiac or respiratory arrest.

Another concept is ‘**Allow Natural Death**’ or **AND**, is a term used in some hospitals as an alternative to the more traditional DNR order. ‘Allow Natural Death’ order is used to make sure that only comfort measures, to provide excellent control of pain or other symptoms, are taken. This includes withholding or discontinuing resuscitation, artificial feedings, fluids, and other treatments that prolong the dying process without adding to patient’s quality of life. Allowing a natural death means not interfering with the natural dying process. It also means that every effort will be made to have the patient’s time of death be calm and peaceful.¹⁰

Even though DNR is considered as **passive euthanasia**, it is practiced in most parts of the world without much legal issues.¹¹ However, terminology like **assisted suicide** and **physician-assisted suicide** (PAS) are not synonyms of euthanasia.¹² PAS and active euthanasia are illegal in most parts of the world, with the exception of Switzerland and the Netherlands, there is pressure from some politicians and patient support groups to legalize this practice in and around Europe that could possibly affect many parts of the world.¹³

Professional integrity is to be maintained so as to avoid moral conflict. Distributive justice is served in that an open discussion of options, resources, and outcomes should follow with the patient and family. The **American College of Surgeons** has recently adopted similar guidelines.¹⁴ These statements provide an important basis from which institution can develop policies to address the issue of perioperative DNR orders.

INDIAN PERSPECTIVE

The DNR order is still not documented legal practice in India. It is an oral communication between the clinician and the patient’s relative or caregiver. The autonomy of the patient also remains a weak concept. Even the right to live a dignified

life or die a dignified death has not been extensively discussed in judiciary. The law is ambiguous on most of the issues related to end-of-life care. The financial issues of the patient here appear to be the deciding factor. In most cases it is seen that health-care expenses are entirely borne either by the patient or by the patient's relative¹⁵, but always plays an important role in continuation of the expensive procedures.

In India such guidelines are not followed in their entirety, or are difficult to follow when treating terminally ill patients. Even the Hon'ble Courts of India has debated for decades to admit passive euthanasia by means of withdrawal of life-support to patients in a permanent vegetative state (PVS) in the case of Aruna Shanbaug, who had been in a vegetative state for more than 37 years at King Edward Memorial Hospital, though Apex Court has finally admitted it on 7th March, 2011. As per Indian Medical Council (Professional conduct, etiquette and ethics) regulations, practicing voluntary euthanasia is also an unethical conduct.¹⁶

Guidelines were recently proposed for limiting life-prolonging interventions and providing palliative care towards the end of life in Indian intensive care units.¹⁷ However, similar guidelines are lacking in an operating room set-up where the chance of survival in "witnessed arrests" is high.

Hon'ble Supreme Court of India on 9th march, 2018, has legalized the passive euthanasia in a landmark verdict, permitting 'living will' by patients on withdrawing medical support if they slip into irreversible coma.¹⁶ This legalization on passive euthanasia in India has recognized that a terminally ill patient or a person in PVS can execute an "advance medical directive" or a "living will" to refuse medical treatment.

Many of us support the right of a terminally ill patient to die, but what if the right becomes an obligation? What is the potential for abuse by impatient heirs? Should dying patients have the right to order their doctors not to start or continue their medical treatment? Should the doctors be protected from prosecution if they shorten a patient's life-expectancy with pain-killing drugs? Many people would answer yes to both the questions. But, does this mean we need a 'right to die' law? There are more to the issue of euthanasia than first meets the eye.

The legal issues of PAS and euthanasia in India are covered in the **Indian Penal Code**. According to Penal Code 1860, active euthanasia is an offence under Section 302 (punishment for murder) or at least under Section 304 (punishment for culpable homicide not amounting to murder). The difference between euthanasia and physician assisted death lies in who administers the lethal dose; in euthanasia, this is done by a doctor or by a third person, whereas in physician-assisted death, this is done by the patient himself.

The issues related to DNR, DNI, AND, PAS and euthanasia are controversial which has recently caught the interest of media, public, politicians, and medical profession. Various socio-cultural organizations argue that hospitals do not pay attention to patients' wishes, especially when they are suffering from terminally ill, debilitating illnesses, and non-responding medical conditions. This is bound to change with

the new laws, which might be implemented if PAS and active euthanasia are legalized.

On request, nothing can be done to assist the patient to end his life in India. It will be an offense by the patient of suicide covered under Section 309 IPC and the medical man who causes death of such person are abetting the act and is covered under Section 306 IPC (abetment of suicide).

REFERENCES

1. Truog RD. "Do-not-resuscitate" orders during anaesthesia and surgery. *Anesthesiology* 1991;74:606-8.
2. Jackson SH, Van Norman GA. Goals- and values-directed approach to informed consent in the "DNR" patient presenting for surgery: more demanding of the anaesthesiologist? *Anesthesiology* 1999;90:3-6.
3. Choudhry NK, Choudhry S, Singer PA. CPR for patients labelled DNR: the role of the limited aggressive therapy order. *Ann Intern Med* 2003;138:65-8.
4. La Puma J, Silverstein MD, Stocking CB. Life-sustaining treatment: a prospective study of patients with DNR orders in a teaching hospital. *Arch Intern Med* 1988;148:2193-8.
5. Omnibus Budget Reconciliation Act of 1990. Title IV, Section 4206. *Congressional Record*, Oct. 26 1990;136:H12456-7.
6. Margolis JO, McGrath BJ, Kussin PS, Schwinn DA. Perioperative do not resuscitate (DNR) orders: a survey of major institutions. *Anesthesiology* 1994;81:A1311.
7. Clemency MV, Thompson NJ. "Do not resuscitate" (DNR) orders and the anesthesiologist: a survey. *Anesth Analg* 1993;76:394-401.
8. Troug RD. "Do-not-resuscitate" orders during anesthesia and surgery. *Anesthesiology* 1991;74:606-8.
9. Franklin CM, Rothenberg DM. Do-not-resuscitate orders in the presurgical patient. *J Clin Anesth* 1992;4:181-4.
10. Curesearch. [cited 2018 June 20]; Available from: URL:<https://curesearch.org/DNR-DNI-AND>
11. British Broadcasting Corporation. Ethics Guide. Euthanasia. 2014. [cited on 2018 June 20]; Available from: URL:<http://www.bbc.co.uk/ethics/euthanasia/overview/introduction.shtml>
12. Chao DV, Chan NY, Chan WY. Euthanasia revisited. *Fam Pract* 2002;19:128-34.
13. Farooq Khan and George Tadros. Physician-assisted Suicide and Euthanasia in Indian Context: Sooner or Later the Need to Ponder! *Indian J Psychol Med* 2013 Jan-Mar;35(1):101-105.
14. Fine PG. DNR in the OR—anesthesiologists, medical ethics and guidelines. *ASA Newsletter* 1994;58:10-4.
15. Mani RK. Limitation of life support in the ICU: ethical issues relating to end of life care. *Indian J Crit Care Med* 2003;7:112-7.
16. Mahanta Putul. Euthanasia: dying with dignity. *The Assam Tribune* 2018 March 14;editorial:6.
17. Mani RK, Amin P, Chawla R, Divatia JV, Kapadia F, Khilnani P, et al. Limiting life-prolonging interventions and providing palliative care towards the end of life in Indian intensive care units. *Indian J Crit Care Med* 2005;9:96-107.

Address for correspondence:

*Dr. Putul Mahanta

MD, FIAMLE, FICFMT

Associate Professor of Forensic Medicine and Toxicology
Tezpur Medical College, Tezpur, Assam, India

Editor-in-Chief: International Journal of Health Research & Medico Legal practice

Email: drpmahanta@gmail.com

Mobile: +918638373805

ORIGINAL PAPER

A clinical study of peripheral vascular diseases in type 2 diabetes mellitus

Bhattacharyya Dipen K¹, Bhattacharyya Dipak K², Barua Swaroop K³, Nath Sivam RK⁴

Received on December 23, 2016; editorial approval on March 07, 2017

ABSTRACT

Background: Peripheral Vascular Disease (PVD) is a very common complication of Diabetes Mellitus, but as the whole spectrum of PVD is mostly asymptomatic or only mildly symptomatic, it is likely to be under-estimated or under-diagnosed and lack of awareness may lead to significant morbidity and mortality. **Methods:** The study was done on 74 patients of type 2 diabetes mellitus, admitted into the department of Medicine and allied specialities. Detailed history, clinical examination, biochemical parameters, ankle-brachial index (ABI) and all other relevant investigations were done in all patients. **Results:** In the total of 74 patients, the prevalence of PVD is found to be 17.56% where the mean duration of diabetes was 9.2 ± 4.3 years. About one-third of the patients were asymptomatic while 53.8% were of foot ulcer, followed by intermittent claudication and gangrene. Longer duration of diabetes, deranged lipid profile, raised levels of HbA_{1c} and CRP and smoking habit were found to be significantly related to the incidence of PVD. **Conclusion:** PVD, in most cases is asymptomatic, but carry significant risks regarding morbidity and mortality. Early detection by screening for PVD may go a long way in preventing these in the high risk groups.

Keywords: Ankle brachial index, lipid profile, C-Reactive protein

INTRODUCTION

Peripheral vascular disease (PVD), the pathological narrowing of lumen of arteries causing reduction in blood supply to extremities, is a common condition with variable morbidity affecting men and women over age of 40 years.¹ It is a common manifestation of the atherosclerotic disease process usually in its diffuse and severe form. Diabetes mellitus is an important risk factor of PVD, with the incidence of the later in presence of the former reportedly varying from 14.4% to

20.46%.²⁻⁴ Longer duration of diabetes and higher levels of glycosylated haemoglobin (HbA_{1c}) have been seen to be directly related to the development of PVD in diabetes mellitus.²⁻⁴ Other risk factors found to be significantly associated with PVD were higher age of patient, higher systolic and diastolic blood pressure, smoking habit and presence of coronary artery disease.⁴ In relation to the association of lipid profiles in the genesis of PVD, the findings were inconclusive, with few studies getting no significant variables to relate to PVD while others have implicated triglyceride as the only variable.^{2,3} Endothelial inflammation, as evident from rising high-sensitivity C-reactive protein (hs-CRP), has also been related to the pathogenesis of diabetic vascular disease.⁵

Though the cardinal symptom of PVD is intermittent claudication, majority of the patients are largely asymptomatic, but carry potentially significant risks of morbidity including diabetic foot, gangrene and other vascular complications, and even increased mortality. Hence screening for PVD has been suggested to be made a routine practice at primary care level.⁶

The main objectives was study the incidence and presenting features of Peripheral Vascular Disease in patients with type 2 diabetes mellitus; to assess vascular involvement in both symptomatic and asymptomatic patients; and to study the correlation of PVD with duration of diabetes, levels of HbA_{1c}, CRP, Lipid profile and the habit of smoking.

Address for correspondence:

¹Associate Professor of Medicine

Email: bhattadipen63@gmail.com

Mobiles: 09864012133 / 08812861139

²Associate Professor and Head, Cardio-thoracic and vascular Surgery

Assam Medical College, Dibrugarh, Assam

³Professor of Medicine; ⁴Registrar of Cardiology, Gauhati Medical College and Hospital, Guwahati

Cite this article as: Bhattacharyya Dipen K, Bhattacharyya Dipak K, Barua Swaroop K, Nath Sivam RK. A clinical study of peripheral vascular diseases in type 2 diabetes mellitus. *Int J Health Res Medico Leg Prae* 2018 July;4(2): 3-5. DOI 10.31741/ijhrmlp.v4.i2.2018.2

METHODS

Place of study: Gauhati Medical College and Hospital, Guwahati, Assam, India. **Type of study:** Hospital based observational study. **Duration and design of study:** Study was conducted from 1st July, 2011 to 30th June 2012. Data was collected by taking proper history, doing thorough clinical examination and with the help of relevant investigations. Investigations included Blood R/E, Urine R/E, Fasting and post-prandial Blood glucose, HbA_{1c}, Creatinine, blood urea, fasting lipid profile, Liver Function tests, CRP, TSH, Chest X-Ray, Ankle brachial index (ABI), color Duplex and color waveform Doppler combine ultrasound and any other relevant investigations, if indicated. For clinical evaluation of PVD, ABI is calculated, recording peak systolic pressure at first appearance of sound, using non-invasive colour Doppler study by using the formula:

ABI = Ankle systolic blood pressure ÷ Brachial systolic blood pressure.

ABI less than 0.9 was taken as an indicator of PVD in our study.⁷ Data were then put into preformed and pretested proforma and due statistical analysis was done.

Inclusion criteria: All the patients included in this study were hospitalised cases suffering from type 2 diabetes mellitus as per criteria outlined by American Diabetes Association (ADA) guidelines.

Exclusion criteria: (1) Patients with type 1 diabetes mellitus, (2) Type 2 diabetics with hypothyroidism, chronic liver disease, chronic kidney disease, connective tissue disease or those on lipid lowering agents.

RESULTS

Out of the total 74 patients, 41 (55.40%) were males while 33 (44.60%) were females. Mean age of the patients was 54.56 ± 13.15 years with the highest number of 24 patients in the age group of 51 to 60 years. The mean duration of diabetes was 9.2 ± 4.3 years and majority of patients were of duration of less than 5 years. Using ABI of less than 0.9 as cut off, prevalence of PVD was found to be 17.56% (13 cases) (**Table 1**).

Table 1 Showing the prevalence of PVD in study population using ABI

Ankle Brachial Index	No. of cases	Percentage among study group	Percentage among PVD patients
<0.4	1	1.35	7.69
0.4–0.69	2	2.70	15.38
0.7–0.89	10	13.51	76.92
>0.9	61	82.44	—

No statistically significant difference in the incidence of PVD was noted between both the sexes. Foot ulcer (53.85%), followed by intermittent claudication (38.46%) and gangrene (38.46%) were the most common presenting symptoms in PVD while 30.77% of the patients were asymptomatic (**Table 2**).

Table 2 Presenting features in cases of PVD in Diabetes

Symptom	Number	% among study group	% among PVD patients
Intermittent claudication	5	6.75	38.46
Rest pain	3	4.05	23.07
Foot ulcer	7	9.45	53.85
Gangrene	5	6.75	38.46
Acute arterial occlusion	0	0	0
Embolization	0	0	0
Asymptomatic	4	5.4	30.77

Out of a total of 21 patients having diabetes of duration of more than 15 years, 10 (47.60%) were found to have PVD, while it was found in 3 cases (23.07%) out of 13 in the group of diabetics with duration of 10 to 15 years. None of the patients with diabetes of a duration of less than 10 years were found to have PVD ($p < 0.05$) (**Table 3**).

Table 3 Showing the duration of diabetes and incidence of PVD

Duration of diabetes (Years)	No. of Patients	No. PVD cases	Percentage of PVD in the group
0 - 5	32	0	0
5 - 10	8	0	0
10 - 15	13	3	23.08
>15	21	10	47.62

($p < 0.05$)

Incidence of PVD was highest in the age group above 60 years (30%) followed by those in the age group of 50 to 60 years (20.83%). None of the subjects below 40 years were found to have PVD (**Table 4**).

Table 4 Age distribution and prevalence of PVD in the study group

Age (in years)	No. of diabetics	No. of PVD patient in group	% of PVD in the group.
< 30	3	0	0
30 - 40	8	0	0
40 - 50	19	2	1.05
50 - 60	24	5	20.83
>60	20	6	30

35 patients (47.92%) out of the total of 74, had deranged lipid profile and amongst them, 11 patients (31.42%) had PVD. 2 patients, (5.12%) out of the rest 39 patients with normal lipid profile, had evidence of PVD. 11 patients out of 13 PVD cases (84.61%) had deranged lipid profile which is statistically significant ($p < 0.05$).

In this study group, 43 patients had HbA_{1c} level more than 7 NGSP while 31 had below it. Out of the 13 cases with PVD, 12

patients (92.3%) had HbA_{1c} level more than 7 NGSP ($p < 0.05$). CRP level was found to be raised in 9 patients (69.23%) out of 13 patients which is statistically significant ($p < 0.05$).

Regarding smoking habits, 21 cases were smokers and 53 were non-smokers. 8 cases (38.02%) out of the smokers and 5 cases (9.43%) out of the non-smokers had PVD, an observation which is statistically significant ($p < 0.05$). The above observations are summarised in **Table 5**.

Table 5 Risk factors in diabetic patients with and without PVD

Parameters	Total cases	Patients with PVD	No PVD	P value
Lipid profile: Deranged lipid profile	35	11	24	$P < 0.05$
Normal lipid profile	39	2	37	
HbA _{1c} level: HbA _{1c} > 7	43	12	31	$P < 0.05$
HbA _{1c} < 7	31	1	30	
CPR level: Raised CRP	27	9	18	$P < 0.05$
Normal CRP	47	4	43	
Smoking habit: Smokers	21	8	13	$P < 0.05$
Non-smokers	53	5	48	

DISCUSSION

Peripheral vascular disease (PVD) is not an uncommon condition, but is a commonly neglected condition due to absence of serious or debilitating signs and symptoms at the initial stage. In our study of 74 patients, the age range was from 26 to 85 years with a mean of 54.56 ± 13.15 years and the male to female ratio was 1.25:1.^{4,8} The prevalence of PVD was 17.56% with women having a slightly higher incidence that was of no statistical significance.²⁻⁴ The commonest presentation noted in our study was foot ulcer (53.85%) followed by intermittent claudication and gangrene while about one-third of the patients were asymptomatic. While few studies have found intermittent claudication to be the most common presentation, other studies have found that to be foot ulcer, the difference may be due to illiteracy, lack of health awareness and other factors in the study population.^{3,4,8} PVD was not found in patients suffering from diabetes for a duration of less than 10 years, while it was seen significantly higher in cases with longer duration, the prevalence being 47.6% in patients with diabetes of more than 15 years. The duration of diabetes has already been identified as a significant predictor of PVD.^{3,4,9} Higher levels of HbA_{1c} has been associated with PVD by many authors which is also reflected in our study.²⁻⁴ Though varied conclusions are drawn regarding association of lipid profile with the development of PVD, our study showed statistically significant correlation with 11 out of 13 cases (84.61%) of PVD having deranged lipid profile.^{3,10} Increased CRP level has been found to be significantly associated with PVD with 9 out of the 13 cases (69.23%) showing raised CRP. Similar observations were made in earlier studies also.^{5,11} The implication of smoking habit

in the genesis of PVD has been vindicated by the findings of our study where statistically significant correlation between the two has been found.^{2,4,10,11}

CONCLUSION

Peripheral vascular disease has been found to be fairly common in type 2 diabetes mellitus. As the disease is mostly asymptomatic, majority of the patients presented when there was development of foot ulcer. Significant positive correlation of the incidence of PVD with duration of diabetes, levels of HbA_{1c} and lipid profile and presence of smoking habit was noted in this study. Awareness about the entity, both amongst the patients as well as the medical professionals, is very essential for early diagnosis, treatment and prevention of the dreaded complications of the disease.

Ethical Clearance: Taken.

Financial Support: None.

Conflict of Interest: The authors don't have anything to disclose.

REFERENCES

- Kumar P, Clark M, editors. Kumar and Clark's Clinical Medicine. 5th ed. London: WB Saunders; 2002. p. 828-831.
- Guan H, Li YJ, Xu ZR, Li GW, Guo XH, Liu ZM et al. Prevalence and risk factors of peripheral arterial disease in diabetic patients over 50 years old in China. Chin Med Sci J July 2007;22(2):83-88.
- Rhee SY, Guan H, Liu ZM, Cheng SW, Waspadji S, Palmes P et al. PAD-SEARCH Study Group Multi-country study on prevalence and clinical features of peripheral arterial disease in Asian type 2 diabetes patients at high risk of atherosclerosis. Diabetes Res Clin Pract 2007;76(1):82-92.
- Agarwal AK, Singh M, Arya V, Garga U, Singh VP, Jain V. Prevalence of peripheral arterial disease in type 2 diabetes mellitus and its correlation with coronary artery disease and its risk factors. JAPI 2012;60:28-32.
- Megumi Koshikawa, Atsushi Izawa, Takeshi Tomita, Setsuo Kumazaki, Jun Koyoma, Shigetaka Shimodaira et al. Association between circulating endothelial progenitor cells and hs-CRP in patients with diabetes. Br J Diabetes Vasc Dis 2010;10:133-138.
- Diehm C, Kareem S, Lawall H. Epidemiology of peripheral arterial disease. Vasa 2004;33(4):183-9.
- Michael R Jaff. Peripheral vascular disease. Cardiology Clinics 2002;20(4):491-662.
- Franjo Cocce, Zeljko Metelko, Branimir Jaksic, Nikica Car, Pajica Pavkovic et al. Peripheral arterial disease and diabetes mellitus. Diabetologia Croatica 2008;37(2):47-53.
- Bembi V, Singh S, Singh P, Aneja GK, Arora R. Prevalence of peripheral arterial disease in a cohort of diabetic patients. South Med J 2006;99(6):564-9.
- Milla Kallio, Carol Forsblom, Per-henrik Groop, Mauri Lepantalo. Development of new peripheral arterial occlusive disease in patients with type 2 diabetes during a mean follow-up of 11 years. Diabetes care 2003;26:1241-5.
- Yu Hi, Sheu WH, Song YM, Liu HC, Lee WJ, Chen YT. C-reactive protein and risk factors for peripheral vascular disease in subjects with type 2 diabetes mellitus. Diabet Med Apr 2004;21(4):336-41.

ORIGINAL PAPER

Aerobic bacteriological profile with antibiogram of pus isolates in a tertiary care hospital

Mayengbam Sonita¹, Laifangbam Supriya², Singh HL³

Received on October 30, 2017; editorial approval on December 10, 2017

ABSTRACT

Introduction: Being a new institute, antibiotic policy is still not in place. We have made an effort to set the empiric treatment for Gram positive cocci and Gram negative bacilli causing aerobic pyogenic infections. **Material and Methods:** The total of 134 pus samples received at the bacteriological section were inoculated onto Blood agar and MacConkey agar media and incubated at 37°C for 24 hours and identification of bacteria from positive cultures was done with standard microbiological technique. The antimicrobial susceptibility tests (AST) were done by Kirby–Bauer’s disk diffusion method on Mueller–Hinton agar and interpreted as per Clinical Laboratory Standard Institution guidelines. **Observation and Result:** The most common organism was *Staphylococcus aureus* 53.84%, followed by *Escherichia coli* 20.87% and *Pseudomonas* species 5.49%. **Conclusion:** This study concludes by proposing Gentamycin and Ceftriaxone as empirical treatment for Gram positive cocci and Gram negative bacilli.

Keywords: Pyogenic infection, antibiotic sensitivity pattern

INTRODUCTION

The spread of antimicrobial resistance is now a global problem, which is due to significant changes in microbial genetic ecology, as a result of indiscriminate use of antimicrobials.¹ Pyogenic infection is characterized by several local inflammation, usually with pus formation, generally caused by one of the pyogenic bacteria.² A wide variety of aerobic and anaerobic bacteria may be responsible for pyogenic infection either singly or in combination.³ The current spread of multi drug resistant bacteria from clinical isolates has increased the need for regular updates in the knowledge of the bacteriological review of pus culture reports so as to avoid the unguided empirical treatment which appears to differ in various environment.⁴ Being a new institute, antibiotic policy is still not in place. We have made an effort to

set the empiric treatment for Gram positive cocci and Gram negative bacilli causing aerobic pyogenic infections. Therefore, the objectives of the present study were to identify aerobic bacteria in pus isolates and identify the antibiotic susceptibility pattern of the isolated organism.

MATERIAL AND METHODS

This was a cross sectional study conducted in Department of Microbiology, Jawaharlal Nehru Institute of Medical Sciences, Manipur. Ethical approval from the institutional ethics committee was sought. A total of 134 pus samples received at the bacteriological section were inoculated onto Blood agar and MacConkey agar media and incubated at 37°C for 24 hours. After incubation, identification of bacteria from positive cultures was done with standard microbiological technique.⁵ The antimicrobial susceptibility tests (AST) were done by Kirby–Bauer’s disk diffusion method on Mueller–Hinton agar and interpreted as per Clinical Laboratory Standard Institution guidelines.⁶ Reports issued included the name of the bacteria isolated up to the species level and its AST. Different species of the same genus isolated were clubbed together as our concern is more on the antimicrobial sensitivity pattern. And, the data were analysed for a period of one year from June 2016 to June 2017.

Antibiotics used for *Staphylococcus aureus* were Penicillin

Address for correspondence:

¹Post graduate trainee

Mobile: +918729935682

Email: sonitadevi@yahoo.co.uk

²Associate Professor (**Corresponding author**)

Mobile: +919402882477

Email: slaifangbam@gmail.com

³Professor and Head

Department of Microbiology

Jawaharlal Nehru Institute of Medical Sciences (JNIMS)

Porompat-795005, Imphal –East, Manipur, India

Cite this article as: Mayengbam Sonita, Laifangbam Supriya, Singh HL. Aerobic bacteriological profile with antibiogram of pus isolates in a tertiary care hospital. *Int J Health Res Medico Leg Prae* 2018 July;4(2): 6-10. DOI 10.31741/ijhrmlp.v4.i2.2018.3

(10µg), Erythromycin (15µg), Clindamycin (2µg), Ciprofloxacin (5µg), Cotrimoxazole, Chloramphenicol (30µg), Gentamycin (10µg), Linezolid (30µg), Vancomycin (30µg) and Cefoxitin (30µg).

Antibiotics used for Enterococcus species were Penicillin (10µg), Linezolid (30µg), Vancomycin (30µg), Daptomycin, High level resistance Gentamycin and High level resistance streptomycin.

Antibiotics used for Gram negative organisms were Ampicillin (10µg), Ciprofloxacin (5µg), Cefotaxime (30µg), Meropenem (10µg), Amikacin (30µg), Amoxycyclavulanic acid (20/10µg), Ceftriaxone (30µg) and Chloramphenicol (30µg).

Antibiotics used for Pseudomonas species were Ceftazidime (30µg), Gentamycin (10µg), Ciprofloxacin (5µg), Piperacillin-tazobactam (100/10µg), Amikacin (30µg), Meropenem (10µg), Ceftriaxone (30µg) and Cefepime (30µg).

Antibiotics used for Acinetobacter species were Ampicillin-sulbactam (10/10µg), Gentamycin (10µg), Ceftazidime (30µg), Ciprofloxacin (5µg), Amikacin (30µg), Meropenem (10µg), Ceftriaxone (30µg) and Cefepime (30µg).

Statistical analysis: Quantitative variables, Continuous demographic variables (age, sex, and others) were expressed as number while qualitative variables were expressed as percentages.

RESULTS

Out of the 134 pus samples analysed in our study, 92 (68.65%) were culture positive and 42 (31.34%) were sterile. Only one sample was identified as *Candida* species. 6 (6.74%) samples had mixed infections of two different aerobic bacteria. 56.17% of the positive culture reports belonged to IPD and 43.83% belonged to OPD. The most common age group was 30-40 years.

Table 1 Showing different isolated aerobic bacteria

Organism	Number	Percentage
<i>Staphylococcus aureus</i>	49	53.84
<i>Escherichia coli</i>	19	20.87
<i>Pseudomonas spp</i>	5	5.49
<i>Proteus spp</i>	4	4.39
<i>Klebsiella spp</i>	3	3.29
<i>Citrobacter spp</i>	2	2.19
<i>Coagulase negative Staphylococcus aureus</i>	2	2.19
<i>Enterococcus spp</i>	1	1.09
<i>Staphylococcus aureus & Proteus spp</i>	2	2.19
<i>Staphylococcus aureus & Acinetobacter spp</i>	1	1.09
<i>Proteus spp & Klebsiella spp</i>	1	1.09
<i>Pseudomonas & Staphylococcus aureus</i>	1	1.09
<i>Proteus spp & Pseudomonas</i>	1	1.09

Table 1 shows different aerobic bacteria isolated in our study. The most common organism was *Staphylococcus aureus* 53.84%, followed by *Escherichia coli* 20.87% and *Pseudomonas* species 5.49%. Only two samples showed mixed growth of *Staphylococcus aureus* and *Proteus* species otherwise mixed growth of *Staphylococcus aureus* and *Acinetobacter* species, *Proteus* Species and *Klebsiella* species, *Pseudomonas* species and *Staphylococcus aureus* and *Proteus* species and *Pseudomonas* species were seen only in one sample each.

Table 2 Antibiotic sensitivity pattern of Gram positive cocci

Antibiotics	<i>Staphylococcus aureus</i> Total=53	<i>Enterococcus spp</i> Total=1	CONS Total = 2
Penicillin	10 (18.86%)	1 (100%)	1 (50%)
Azithromycin	29 (54.71%)	-	1 (50%)
Clindamycin	41 (77.35%)	-	2 (100%)
Ciprofloxacin	30 (56.60%)	-	-
Cotrimoxazole	30 (56.60%)	-	-
Chloramphenol	18 (33.96%)	-	-
Gentamycin	42 (79.24%)	-	-
Linezolid	53 (100%)	1 (100%)	2 (100%)
Vancomycin	53 (100%)	1 (100%)	2 (100%)
Cefoxitin	6 (11.32%)	-	2 (100%)
HLR			
Gentamycin	-	1 (100%)	-
Daptomycin	-	1 (100%)	-
HLR			
Streptomycin	-	1 (100%)	-

Table 2 Shows the antibiotic sensitivity pattern of Gram positive cocci as per the CLSI guidelines. In our study, *Staphylococcus aureus* was least sensitive to Penicillin (18.86%). Sensitivity of Azithromycin, Clindamycin, Ciprofloxacin, Cotrimoxazole, Chloramphenicol and Gentamycin were 54.71%, 77.35%, 56.60%, 56.60%, 33.96% and 79.24% respectively. 100% sensitivity was seen with Vancomycin and Linezolid. Only 11.32% were sensitive to Cefoxitin. Therefore, MRSA accounted for about 88.68%.

There was only one isolate of *Enterococcus* species, which was found to be sensitive to all the drugs tested i.e., Penicillin, Linezolid, Vancomycin, HLR Gentamycin, HLR Streptomycin and Daptomycin.

Amongst the CONS, out of the two isolates, both were sensitive to Clindamycin, Linezolid, Vancomycin, Cefoxitin but only one was sensitive to Penicillin and Erythromycin.

Table 3 Antibiotic sensitivity pattern of Gram negative bacilli

Antibiotics	<i>Escherichia coli</i> -19	<i>Klebsiella</i> spp-4	<i>Proteus</i> spp-8	<i>Citrobacter</i> spp-2
Ampicillin	9(47.36%)	3(75%)	5(62.5%)	1(50%)
Ciprofloxacin	11(57.89%)	3(75%)	5(62.5%)	1(50%)
Cefotaxime	9(47.36%)	2(50%)	3(37.5%)	2(100%)
Meropenem	15(78.94%)	3(75%)	7(87.5%)	2(100%)
Amikacin	16(84.21%)	3(75%)	6(75%)	2(100%)
Amoxyclo- vulanic acid	7(36.84%)	1(25%)	3(37.5%)	1(50%)
Chloram- phenicol	13(68.42%)	2(50%)	5(62%)	1(50%)
Ceftriaxone	15(78.947%)	3(75%)	6(75%)	1(50%)

Table 3 Shows the antibiotics sensitivity pattern of the Gram negative organism isolated in our study.

Escherichia coli was most sensitive to Amikacin (84.21%) followed by Ceftriaxone and Meropenem (78.94%). *Escherichia coli* were least sensitive to Amoxyclo-vulanic acid (36.84%). Amongst the *Klebsiella* species isolates Ampicillin, Ciprofloxacin, Meropenem, Amikacin and Ceftriaxone showed the highest sensitivity (75%). Cefotaxime and Chloramphenicol were 50% sensitive and Amoxyclo-vulanic acid was the least sensitive (25%). For *Proteus* species, Meropenem was the most sensitive (87.5%) followed by Amikacin and Ceftriaxone (75%), Ciprofloxacin, Ampicillin and Chloramphenicol (62.5%) respectively. Cefotaxime and Amoxyclo-vulanic acid showed least sensitivity (37.5%). Both the *Citrobacter* species isolates were sensitive to Cefotaxime, Meropenem and Amikacin (100%). And, only one showed sensitivity to Ampicillin, Ciprofloxacin, Amoxyclo-vulanic acid, Chloramphenicol and Ceftriaxone (50%) respectively.

Table 4 Antibiotic sensitivity pattern of *Pseudomonas* spp

Antibiotics	<i>Pseudomonas</i> spp (7) Sensitivity (%)
Ceftazidime	3(42.85%)
Gentami cin	3(42.85%)
Piperacillin-tazobactam	5(71.42%)
Ciprofloxacin	5(71.42%)
Amikacin	4(57.14%)
Meropenem	4(57.14%)
Ceftriaxone	4(57.14%)
Cefepime	2(28.57%)

Table 4 Shows the antibiotic sensitivity pattern of *Pseudomonas* species. Highest sensitivity was shown by Ciprofloxacin and Piperacillin-tazobactam with 71.42%

sensitivity each followed by Amikacin, Meropenem and Ceftriaxone with sensitivity of 57.14% each. Cefepime showed the least sensitivity of 28.57%.

In our study, there was only one isolate of *Acinetobacter* species and it was sensitive to Ampicillin-Sulbactam, Gentamycin, Ciprofloxacin, Meropenem, Amikacin, Ceftriaxone and Cefepime but found to be resistant to Ceftazidime.

DISCUSSION

In our study, a total of 68.65% showed culture positive for aerobic bacteria out of which 6.74% samples had mixed infections of two different aerobic bacteria. Similar finding was also reported by B Biradar A et al.⁷ Majority of our results were mono-microbial (96.73%) and *Staphylococcus aureus* was found to be the most common pathogen in our study (55.06%), similar reports were also observed by Sharma A et al.⁸⁻¹⁰ Biradar A et al observed similar results and P Tiwari et al.^{8,11} The second common pathogen in our study was *E. coli* (21.34%) followed by *Pseudomonas* spp. 5.62%. Duggal S et al also found similar result.¹² Though *S. aureus* was the predominant organism, Gram-positive cocci accounted for only 49% of the total isolates, 51% being Gram negative bacilli. Such GNB dominance in the aerobic growth in pus culture has been highly seconded by studies reported by Mantravadi HB.¹³

In our study, Gram positive organisms obtained were 100% sensitive to Vancomycin and Linezolid. *Staphylococcus aureus* isolates were more from OPD than IPD and difference in the sensitivity pattern was observed between the two though the statistical significance was not found out as the difference were in few numbers and also the sample size was small. Amongst the in-patient *Staphylococcus aureus* showed sensitivity to Gentamycin and Clindamycin. Amongst the out-patient, the most sensitive drug was Azithromycin followed by Gentamycin. We found that only 18.86% of *Staphylococcus aureus* was sensitive to Penicillin and it was comparable with the finding of Jamatia A et al.¹⁴ Ananthi B et al.¹³ also found that Gram positive organisms were 100% sensitive to Vancomycin and Linezolid. In our study, MRSA were 88.67%. Therefore, empirical antibiotic treatment should be primarily directed against this pathogen. Tiwari P et al.^{8,10} suggested that strict enforcement of hand washing and timely discharge of patients without delay will go a long way towards reducing the spread of this pathogen in this hospital.¹⁵

Amongst the GNB isolated in our study, *Escherichia coli* (20.87%) was the most common pathogenic isolate though it was the second most common organism isolated. It was found that it was most sensitive to Amikacin, followed by Meropenem which was similar when compared to a study conducted by Mantravadi HB et al.^{16,17} There was no difference observed in the sensitivity pattern amongst the IPD and OPD isolates.

In our study, *Pseudomonas* species (5.49%) was the 3rd most common pathogenic isolate and were most sensitive to ciprofloxacin and Piperacillin-tazobactam (71.42%);

comparable finding was also seen in other studies.^{16,18,19} *P. aeruginosa* is a prototypical “multidrug resistant (MDR) pathogen” recognized for its ubiquity, its intrinsically advanced antibiotic resistance mechanisms. *P. aeruginosa* is a reason for high fatality rate, as it has arisen as a vital pathogen for nosocomial infection in hospital settings.²⁰ Therefore, judicious usage of antibiotics becomes a necessity.

In our study, the incidence of Coagulase negative Staphylococcus (CONS), which grew as pure growth was only 2.19%, which may be due to small sample size. And, we have reported CONS as pathogenic as it is now being increasingly recognized as pathogens. CONS have become a common cause of nosocomial infections.²¹ But we sent the reports with a note stating to clinically correlate as CONS is an opportunistic bacteria. Mane P et al found that 15.53% CONS isolates were from pus.²¹⁻²³ Golia Set aland Asangi Y S et al found CONS isolates from pus samples were 47% and 33.3% respectively.²⁴⁻²⁶

The strength of the study was that the laboratory technicians have been consistent with their tests results which increases comparability and reliability and reduces variability.

CONCLUSION

This study concludes by proposing Gentamicin and Ceftriaxone as empirical treatment for Gram positive cocci and Gram negative bacilli. The antibiotic pattern and the bacterial profile of pus may change from time to time and place to place, as observed by different studies. Therefore, similar studies should be conducted from time to time. And, there is a need for larger scale study for more significant results. There is also a need to include anaerobes in such studies.

Conflict of interest: No conflict of interest associated with this work.

Ethical issues: Ethical clearance was sought from the institutional ethics committee.

Source of funding: None.

Author’s contribution: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. **Contributions:** 1) Dr Sonita Mayengbam has done data collection, literature search, result analyses and write up. Dr Supriya Laifangbam has done literature search, result analyses and write up. Prof Huidrom Lokhendro Singh has done results analyses. Any of the authors does not infringe any copyright or violate any other right of any third parties; (2) The article has not been published (whole or in part) elsewhere, and is not being considered for publication elsewhere in any form, except as provided herein; (3) All authors have contributed sufficiently in the Article to take public responsibility for it and (4) All authors have reviewed the final version of the above manuscript and approve it for publication.

Acknowledgements: All staffs in bacteriology section.

REFERENCES

1. Ananthi B, Ramakuma M, V Kalpanadevi V, Abigail SR, Karthiga L, Victor KH. Aerobic bacteriological profile and antimicrobial susceptibility pattern in postoperative wound infections at a tertiary care hospital. IJMCI 2017;4(2):2702-6.
2. DVMVS Rao R, Basu R, Biswas RD. Aerobic bacterial profile and antimicrobial susceptibility pattern of pus isolates in a south Indian tertiary care hospital. JDMS 2014 Mar;13(3):59-62.
3. Sujatha R, Tripathi A, Nidhi V. Microbial characterisation of pus isolates and the changing trends in their sensitivity pattern at a tertiary care hospital in Kanpur city. Rama University J of Medical Sciences 2016;2(3):1-7.
4. Rameshkannan S, Nileschraj G, Rameshprabu S, Mangaiarkkarasi A, Meher Ali R. Pattern of pathogens and their sensitivity isolated from pus culture reports in a tertiary care hospital, Puducherry. IJBAMR 2014 December;4(1):243-8.
5. Procop GW, Church DL. Koneman’s color atlas and textbook of diagnostic microbiology. 7th ed Philadelphia: Wolters Kluwer; 2017. IP-1-119.
6. Clinical and Laboratory Standards Institute (2016). Performance standard for antimicrobial susceptibility testing twenty third informational supplements. CLSI document M100-S26. 2016;33(1).
7. Biradar A, Faisal Farooqui F, Prakash R, Khaqri YS, Ifran Itagi. Aerobic bacteriological profile with antibiogram of pus isolates. IJMR 2016;3(3):245-9.
8. Sharma A, Gupta S. Aerobic bacteriological profile of skin and soft tissue infections (SSTI’S) and its antimicrobial susceptibility pattern at MB Govt. Hospital in Udaipur, rajasthan. IJMSE 2016 April-June;3(2):141-51.
9. Sandhu R, Prakash H, Nagdawan RP. Aerobic bacterial isolates in superlative infections and their antibiogram a reflection of infection control. Int J Pharm Biol Sci 2011 April-June;4(2):186-92.
10. Kumar A, Agrawal AK, Kumar M, Sharma AK, Kumari P. Aerobic bacterial profile of diabetic foot and its antibiogram in RIMS, Ranchi - a tertiary care hospital. IJCMR 2017 January;4(1):251-3.
11. Tiwari P, Kaur S. Profile and sensitivity pattern of bacteria isolated from various cultures in a tertiary care hospital in Delhi. Indian J of Public Health 2010 Oct-Dec;54(4):213-5.
12. Duggal S, Khatri PK, Parihar RS, Rajat Arora R. Antibiogram of various bacterial isolates from pus samples in a tertiary care centre in Rajasthan. IJSR 2013;6-14.
13. Mantravadi HB, Chinthaparthi RM, Shravani V. Aerobic isolates in pus and their antibiotic sensitivity pattern: a study conducted in a teaching hospital in Andhra Pradesh.

- IJMSPH 2015;4(8):1076-9.
14. Jamatia A, Roy D, Shil R, Prabhakar PK. Bacteriological profile and antimicrobial resistance patterns isolates in pus samples at agartala government medical college. Asian J Pharm Clin Res 2017;10(1):335-7.
 15. Tiwari P, Kaur S. Profile and sensitivity pattern of bacteria isolated from various cultures in a tertiary care hospital in Delhi. Indian J Public Health 2010 Oct-Dec;54(4):213-5.
 16. Hosimin K and Prabakaran G. Studies on isolation and characterization of some wound infection causing bacteria. IJCAR 2012October;1(2):26–31.
 17. Girish M Bengalorkar, TN Kumar. Culture and sensitivity pattern of micro-organism isolated from diabetic foot infections in a tertiary care hospital. Int J Cur Biomed Phar Res 201;1(2):34–40.
 18. Kumar H, Singh RP. Incidence and antimicrobial resistance among potential nosocomial bacteria isolated from indoor environment of hospital. Int J Cur Microbiol App Sci 2015;4(3):134-42.
 19. Rai S, Yadav NU, Pant DN, Yakha JK, Tripathi PP, Poudel A et al. Bacteriological profile and antimicrobial susceptibility patterns of bacteria isolated from pus/wound swab samples from children attending a tertiary care hospital in Kathmandu, Nepal. I J Microb 2017;5:1-5.
 20. Namita A Raytekar, Meghna R Choudhari, Sonali Das. Antibiotic profiling of pseudomonas aeruginosa isolates from pus sample of rural tertiary care hospital of western Maharashtra, Loni, India. Int J Res Med Sci 2017 Jul;5(7):3076-81.
 21. Mane P, Mane M, Mohite ST, Patil RS. Study of coagulase negative staphylococci isolated from clinical specimens in tertiary care hospital from western Maharashtra. IJSR 2013;6(14):1437-40.
 22. Mane MP, Mane BM, Mohite ST, Patil SR, Pawar SK, GS Karande GS. Biofilm production and antibiotic susceptibility pattern of coagulase negative staphylococci from various clinical specimens in a tertiary care hospital. Intl J of Scientific Study March 2016;3(12): 184-6.
 23. Neelima, Praveen Kumar D, Suresh P, Nandeeshwar. Bacteriological profile of wound infection in rural hospital in Ranga Reddy district, Andhra Pradesh. IJMRHS 2013;2(3):469-73.
 24. Golia S, Bhimacharya Telsang DB, Asha S Kamath B, Tiwari D. Speciation of clinically significant coagulase negative staphylococci and their antibiotic resistant patterns in a tertiary care hospital. Int J Res Med Sci 2015 May;3(5):1242-6.
 25. Asangi YS, Mariraj J, Sathyanarayan MS, Nagabhushan, Rashmi. Speciation of clinically significant coagulase negative staphylococci and their antibiotic resistant patterns in a tertiary care hospital. Int J Biol Med Res 2011;2(3):735-9.
 26. Badampudil VSS, Kirani KRLIS, Gunti R. Speciation and biofilm production of coagulase negative staphylococcal isolates from clinically significant specimens and their antibiogram. JKIMSU 2016 April-June;5(2):69-78.

ORIGINAL PAPER

Clinical and Radiological profile of stroke in children

Das Marami¹, Santosh H², Basumatary Lakshya J³, Goswami Munindra⁴, Bezboruah Gayatri⁵, Kayal AK⁶

Received on November 12, 2017; editorial approval on December 25, 2017

ABSTRACT

Introduction: Stroke in children although relatively rare, needs to be addressed separately as it frequently results in a lack of recognition and a delay in its diagnosis. The various fundamental developmental differences, varied etiological factors and multiple risk factors co-existing make the recognition and treatment of stroke in children different when compared with adults. **Method:** A prospective analysis of 82 cases of stroke in children aged between 1 month to 18 years was undertaken. Stroke was categorized into ischemic (arterial or venous) and intracerebral hemorrhage (ICH). Trial of Org 10172 in Acute Stroke Treatment (TOAST) criteria and ICH location was used to classify and stroke severity was assessed using the Pediatric National Institutes of Health Stroke Scale (PedNIHSS) and ICH score respectively. Neuroimaging (CT/MRI) was done in all cases and were analyzed. **Results:** Hemiparesis was seen in 69 (84.2%), speech disturbance in 31 (37.8%), ataxia in 5 (6.1%) and seizures in 29 (35.4%) cases. Anterior circulation territory was involved in 60 (84.5%), the posterior circulation territory in 7 (9.9%), and both in 4 (5.6%) cases. Infections were the most common cause of stroke noted in 43 (60.6%) cases. **Conclusion:** Intracranial infection is the commonest etiology of stroke in children below 18 years presenting to our hospital. Commonest type of stroke is an ischemic stroke. Most patients improve with conservative management and there is a high survival rate in childhood stroke if timely managed.

Keywords: Acute ischemic stroke, stroke in children, PedNIHSS, Infections.

INTRODUCTION

Stroke is defined by the World Health Organization (WHO) as “a clinical syndrome typified by rapidly developing signs of focal or global disturbance of cerebral functions, lasting more than 24 hours or leading to death, with no apparent causes other than of vascular origin”.¹ Haemorrhagic stroke in paediatric population is more common than adults (45% vs. 10%).^{2, 3}

The recovery is better in pediatric population than in adults with comparable lesion, but there is a lack of a randomized controlled trial in children when compared to adults. Hence, identification of the important risk factors and a targeted clinical approach is required in childhood stroke.

No medical task exists that is more complex, more multifaceted, more important, and potentially more rewarding than caring for a stroke patient. Keeping the above facts in mind, we aim to study the various clinical and radiological profiles, the etiological factors and the outcome in childhood stroke.

METHODS

A prospective analysis of 82 cases of stroke in children occurring in patients aged between 1 month to 18 years⁴ who attended Gauhati Medical College and Hospital between 2015 to 2017. The type of stroke was categorized into ischemic (arterial or venous) and ICH:

- The arterial ischemic stroke (AIS) was defined on the basis of acute focal neurological deficit with corresponding CT or MRI evidence of infarction in an arterial territory.
- The diagnosis of cerebral venous sinus thrombosis (CVST) was based on MR venography findings with

Address for correspondence:

¹Associate Professor
Department of Neurology
Email: moromi13das@yahoo.com
Mobile: +919954742007

²Senior Resident, ³Assistant Professor
⁴Professor & Head (**Corresponding Author**)
Department of Neurology,
Email: goswamimunindra@yahoo.com
Mobile: +919435014264

⁵Professor & Head, Department of Pediatrics

⁶Professor, Department of Neurology
Gauhati Medical College & Hospital, Guwahati, Assam

Cite this article as: Das Marami, Santosh H, Basumatary Lakshya J, Goswami Munindra, Bezboruah Gayatri, Kayal AK. Clinical and radiological profile of stroke in children. *Int J Health Res Medico Leg Prae* 2018 July;4(2):11-16. DOI 10.31741/ijhrmlp.v4.i2.2018.4

evidence of thrombosis in the cerebral venous sinuses or veins.

- c) Intracerebral hemorrhage was diagnosed on the basis CT or MRI with corresponding clinical findings.

The AIS was classified according to TOAST criteria.⁵ The stroke severity at the time of admission was assessed using the PedNIHSS.⁶ ICH score⁷ was used to determine the prognosis in hemorrhagic stroke patients. Seizures were sub-classified according to the International League Against Epilepsy (ILEA) 2017.⁸ An urgent Non-contrast Computed tomography (CT) scan of the head or MRI-Brain with MRA and MRV was done in all patients.

Outcome and follow-up: The outcome of stroke in children was assessed at the time of discharge from hospital and at 3 months follow-up by using Modified Rankin Scale (MRS) for children.⁹

Statistical analysis: The data collected were analyzed using licensed SPSS software version 21.

RESULTS

Among all the cases of stroke, mean age of presentation was 6.01 years. Approximately one fourth of the study subjects 22, (26.8%) belonged to age group of 6-10 years and 18(22%) cases were noted in 3-6years age group. 50 (61%) cases were males and 32(39%) cases were females with a male: female ratio of 1.6:1. More than 2/3rd (69.5%) cases were residents of rural areas.

Out of 82 cases studied, 71(86.6%) had ischemic stroke, 9(11%) had ICH (**Fig. 4**) and 2(2.4%) had CVST. Focal signs like Hemiparesis (**Table 1**) were seen in 69(84.2%) cases. Seizures were the presenting symptoms in 29(35.4%), of which Generalized Tonic-Clonic Seizures (GTCS) were seen in 26(31.7%) cases.

Anterior circulation territory was involved in 60(84.5%) cases, the posterior circulation territory in 7(9.9%) cases, and both in 4(5.6%) cases. Left Middle cerebral artery distribution was the most common vascular territory involved in ischemic stroke comprising of 26(36.7%) cases. Ischemic stroke severity was graded according to initial PedNIHSS score, 21(30%) cases were between 6-10 years age group, followed by 16(22.5%) cases between 3-6years age group.

Infections (**Table 2**) were the most common cause of stroke noted in 43(60.6%) cases, Cardioembolic stroke was noted in 9(12.7%) cases, a total of 3(4.2%) cases with arteriopathy were noted, six (8.5%) cases of Moyamoya disease (**Fig. 2A & 2B**), 9 (12.7%) cases with Leukemia, 3 (4.2%) cases with mineralizing microangiopathy (**Fig.1A & 1B**) were noted.

We found Cardioembolic stroke in 9(12.7%), small vessel occlusion in 22(31%), other determined etiology like arteriopathy (**Fig.3**), mineralizing microangiopathy, hyperlipidemia, hyperhomocysteinemia in 21(29.6%), in 19(26.8%) cases etiology could not be established because of incomplete evaluation for other inherited thrombotic disorders and genetic testing due to financial constraints.

There were no patients with large artery atherosclerosis in our study.

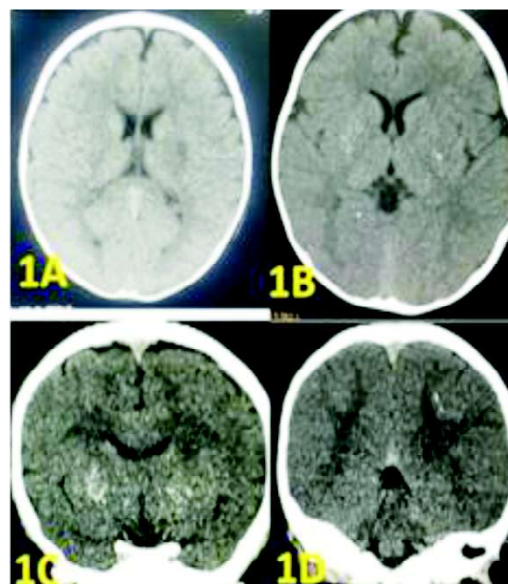


Figure 1 (1A) & (1B) Axial CT brain – hypodense area in left lentiform nucleus suggestive of infarct & punctate hyperdensity in bilateral basal ganglia region. **(1C) & (1D)** coronal reconstruction CT showing linear area of hyperdensities probably related to mineralization of lenticulostriate arteries

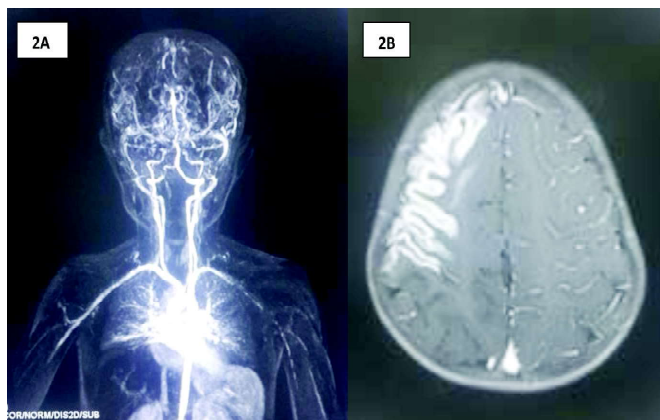


Figure (2A) MR Angiography showing features of occlusion of bilateral ICA (L>R) circulation distal to their clinoid segments with multiple collateral vessels and underlying chronic ischaemic insults. Features are s/o Moya Moya disease. **Figure (2B)** MRI-Brain post-contrast study axial section showing intense gyral enhancement noted along right fronto-temporo-parietal lobar convexity

Laboratory features:

Hemoglobin was <8gm/dl in 10 (12.2%) cases, total leukocyte count <4000 in 17 (20.7%) and >11000 in 29 (35.4%) cases. Platelet count is <20000 in 9 (11%), ESR >20mm AEFr was seen in 30 (36.6%) cases, Anti-nuclear antibody (ANA) by immunofluorescence assay (IFA) was positive in one patient. Serum homocysteine was elevated

Table 1 Analysis of neurological manifestations (n=82)

Neurological manifestations	Types	Cases No.(%)
Level of consciousness	Conscious	68 (82.9)
	Altered sensorium	14 (17.1)
speech and language		31 (37.8)
Intellectual disability		34 (41.5)
Left Hemiparesis		25 (30.5)
Right Hemiparesis		44 (53.7)
Monoparesis		9 (11)
Quadriparesis		4 (4.9)
Hemidystonia		29 (35.4)
Seizures	Focal motor seizures with impaired awareness	3 (3.7)
	Generalized tonic-clonic seizures (GTCS)	26 (31.7)
Stroke	Hemorrhagic	9 (11)
	Ischemic	71 (86.6)
Headache		18 (22)
Cranial nerve involvement		33 (40.2)
Cerebellar signs		6 (7.3)
Meningeal Signs		3 (3.7)

Table 2 Etiologic diagnosis by age-wise distribution (n=82)

Etiology category	1month-1year	>1 – 3 years	>3 – 6 years	>6 – 10 years	>10 – 18 years	p-value
Arteriopathy	3 (3.66)	0	0	0	0	0.04
Cardiac illness						
VSD	0	2 (2.4)	1 (1.2)	0	0	0.251
Ebstein anomaly	1 (1.2)	0	0	0	0	0.026
Tricuspid atresia	1 (1.2)	0	0	0	0	0.251
Severe PS	1 (1.2)	0	0	0	0	0.038
DORV	1 (1.2)	0	0	0	0	0.383
Others			1 (1.2)	1 (1.2)		
Hyperhomocysteinemia	0	0	0	1 (1.2)	0	0.748
Hyperlipidemia	0	0	0	0	1 (1.2)	0.362
Infections	12 (14.6)	10 (12.2)	8 (9.8)	9 (11)	4(4.9)	0.043
Leukemia	1 (1.2)	1 (1.2)	2 (2.4)	3(3.7)	2 (2.4)	0.372
Moyamoya discase	0	0	4 (4.9)	2 (2.4)	0	0.044
Mitochondrial cytopathy	0	0	0	1 (1.2)	0	0.383
Mineralizing microangiopathy	0	1 (1.2)	0	1 (1.2)	1 (1.2)	0.637
CVST	0	1 (1.2)	1 (1.2)	0	0	0.251
Cryptogenic	1 (1.2)	1 (1.2)	3 (3.7)	6 (8.2)	7(9.6)	0.286

in one patient, three (3.7%) cases were detected to have TORCH infection.

Cerebrospinal Fluid (CSF) analysis was performed in 59 (72%) cases where infective etiology was suspected or in whom altered sensorium was not explained by other investigations and neuroimaging features. CSF showed pleocytosis in 12.2% with lymphocytic predominance, increased protein in 54.9%

and decreased glucose in 8.5% of cases. ADA was high in 36.6% cases.

Outcome: All children with a PedNIHSS score above fifteen (9 cases) expired (MRS of 6). Out of the 73 cases who survived, 9 (13.2%) had excellent recovery with MRS-1, 26 (38.2%) had MRS-2, 2 had MRS-4 and 3 cases were lost to follow-up at 3 months.

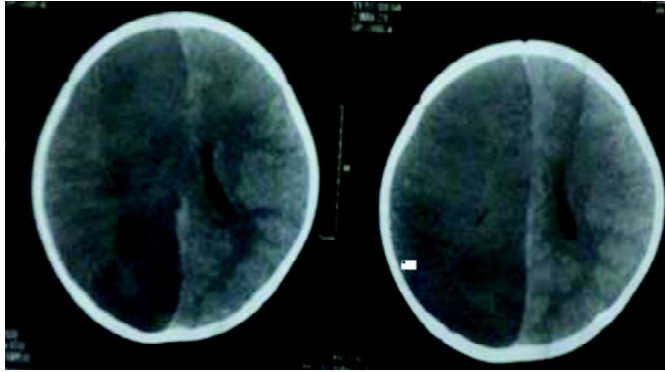


Figure 3 Axial section of CT-brain plain, showing hypodensity over right ICA territory. (A case of post-varicella infection large vessel arteriopathy)

DISCUSSION

In present study stroke was found mostly in 6-10 years age group. 61% were males with a male:female ratio of 1.6:1. This was in accordance with The International Paediatric Stroke Study group (IPSS),¹⁰ Turkey study¹¹ and a Western Rajasthan study.¹² The National Institute of Neurological Disorders and Stroke report was somewhat different, where forty percent of stroke cases were under 1 year of age.¹³ This could be due to the inclusion of neonates in the study who comprised about one-fourth of their study population.

stenosis or spasm initially, followed by progressive occlusion. Therefore, increased incidence of childhood stroke could be observed in rural population, as infective causes are the leading causes of stroke in children.

Birth weight of < 2.5kg was found in 25.1% cases in our study, which is in accordance with the study conducted by, R Rajeswari et al; who had 25.8% of low birth weight (LBW) babies in their study.¹⁴ According to National Family Health Survey-4 (NFHS) 2015-16, prevalence of LBW in India is



Figure 4 Axial section CT-Brain plain showing haemorrhage in left caudate nucleus with surrounding edema

18%.¹⁵ Assessing the trend of low birth weight will be an important key to identify the predominant risk factor and intervene at the earliest.

The presenting symptoms in our study were diverse. Seventy-

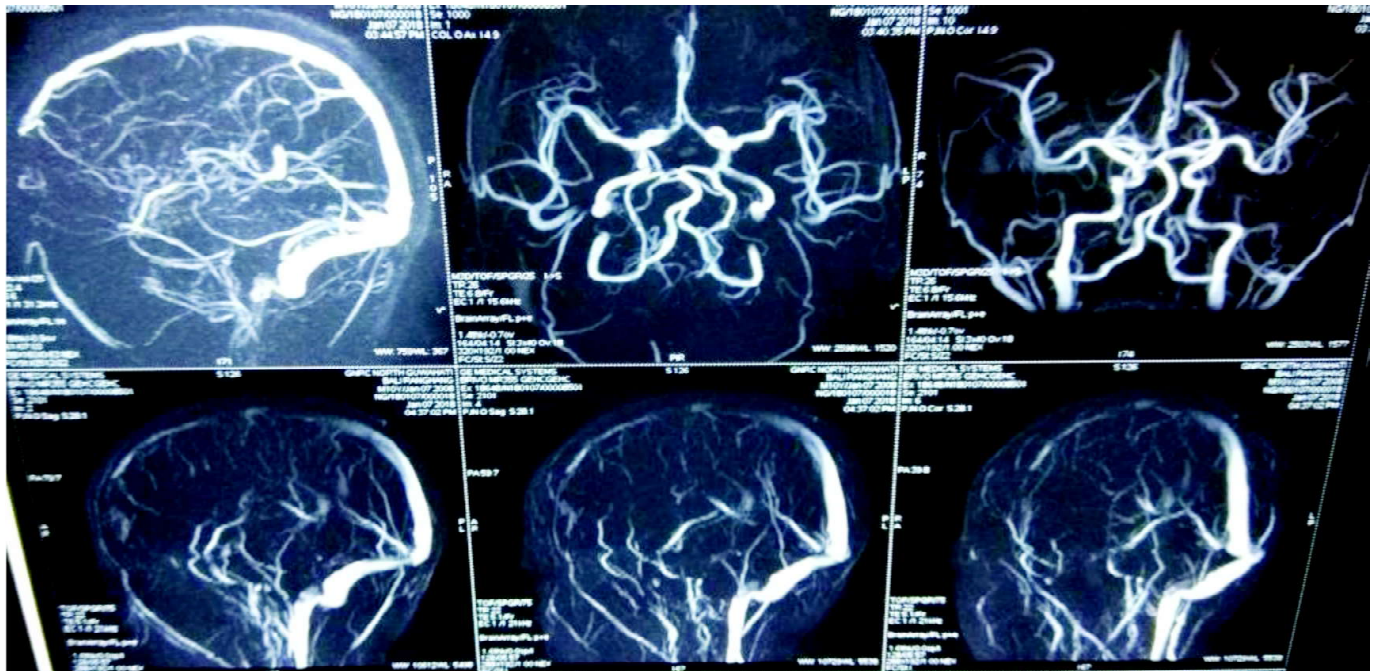


Figure 5 MR Venography reveals lack of flow within the cavernous sinuses, petrosal sinuses and ophthalmic veins bilaterally. There is lack of flow in the right sigmoid sinus

So far, there is only a limited literature discussing the rural predominance in the occurrence of stroke in children. Tuberculous meningitis (TBM) is common in people living in rural areas which can cause progressive vasculopathy with

1 (86.6%) patients had ischemic stroke suggesting it was higher in our study. Both the cases of CVST (**Fig.5**) in our study were of infective aetiology and they improved on follow-up. A study by Saima Bibi *et al*¹⁶ correlated with our findings,

however the findings of the International Paediatric Stroke Study were contradictory from our studies.

Anterior circulation territory involvement was most common with Left middle cerebral artery distribution (MCA) comprising of 26 (36.7%) cases in our study. Sarah Buerki *et al* had anterior circulation territory stroke in 60% children.¹⁷

Initial PedNIHSS score between 15-20 was noted in 9(22.5%) and all 9 cases expired. High PedNIHSS score on admission was an independent predictor of unfavorable outcome. Sandra Bigi *et al* also showed High PedNIHSS/ NIHSS score on admission was an independent predictor of unfavourable outcome among children.¹⁸

Three (4.2%) cases with mineralizing microangiopathy, suspected on the basis of cases presenting with focal deficit following minor trauma due to lacunar stroke involving lenticulostriate vessels, coronal CT-scan brain showing evidence of calcification of these vessels. Of these, two cases were found to have high titres for CMV IgG. Other studies like N. Aydinli *et al*.¹⁹, Siddiqui TS *et al*.²⁰ and Lingappa L *et al*.²¹ found similar results.

In our study, 11% cases expired which was higher than an African study²², J Kalita *et al*,²³ and other studies.²⁴⁻²⁶ CNS infections were the most common cause of stroke in our study and many cases had a higher initial PedNIHSS score which could be the possible explanation for increased mortality reported in our study.

CONCLUSION

The present study has provided valuable insight into clinico-radiological profile of paediatric stroke patients. Extensive evaluation of any child with stroke is highly recommended for discovering probable risk factor and appropriate treatment. Priority should be given to identify the territory involved in the cerebral arterial circulation and identification of potentially modifiable risk factors. Most of the patients improve with conservative management and there is a high survival rate in childhood stroke if timely and appropriately managed.

This study highlights that the occurrence of stroke in children is not a rare entity as believed previously and that many more studies are needed in this area for its better management. There is a need for a large multinational studies of the risk factors for stroke in children. In view of the high recurrence rate in cryptogenic stroke, thorough diagnostic investigation at presentation and follow-up is justified, to prevent the occurrence of subsequent strokes with appropriate management.

Conflict of interest: Nil.

Ethical clearance: Taken.

Contribution of Authors: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

Acknowledgments: The authors are grateful to the Radiology department and Central Laboratory, Gauhati Medical College

and Hospital, for giving timely reports of patients enrolled in this study.

REFERENCES

1. Aho K, Harmsen P, Hatano S, Marquardsen J, Smirnov VE, Strasser T. Cerebrovascular disease in the community: results of a WHO collaborative study. *Bull World Health Organ* 1980;58:113-130.
2. Lynch JK, Hirtz DG, DeVeber G, Nelson KB. Report of the National Institute of Neurological Disorders and Stroke workshop on perinatal and childhood stroke. *Paediatrics* 2002;109:116–23.
3. Earley CJ, Kittner SJ, Feaser BR, Gardner J, Epstein A, Wozniak MA, et al. Stroke in children and sickle cell disease: Baltimore Washington cooperative young stroke study. *Neurology* 1998;51:169–76.
4. Lynch JK, Hirtz DG, DeVeber G, Nelson KB. Report of the National Institute of Neurological Disorders and Stroke workshop on perinatal and childhood stroke. *Pediatrics* 2002;109:116–23.
5. Adams Jr. HP, Bendixen BH, Kappelle LJ, Biller J, Love BB, Gordon DL and the TOAST Investigators. Classification of Subtype of Acute Ischemic Stroke Definitions for Use in a Multicenter Clinical Trial. *Stroke* 1993;24:35-41.
6. Beslow LA, Kasner SE, Smith SE. Concurrent Validity and Reliability of Retrospective Scoring of the Pediatric National Institutes of Health Stroke Scale. *Stroke* 2012;43:341-345.
7. Hemphill III JC, Bonovich DC, Besmertis L. The ICH Score: A Simple, Reliable Grading Scale for Intracerebral Hemorrhage. *Stroke* 2001;32:891-897.
8. Fisher RS, Cross JH, D'Souza C, French JA, Haut SR, Higurashi N et al. Instruction manual for the ILAE 2017 operational classification of seizure types. *Epilepsia* 2017 Apr;58(4):531-542.
9. Bigi S, Fischer U. Acute ischaemic stroke in children and young adults: Differences in clinical presentation, aetiology and outcome. *Ann Neurol* 2011;70:245–254.
10. Mark T. Mackay, Wiznitzer M, Benedict SL, Lee KJ, deVeber GA, and Ganesan V. Arterial Ischemic Stroke Risk Factors: The International Paediatric Stroke Study. *Ann neurol* 2011;69:130–140.
11. Per H, Unal E, Poyrazoglu HG. Childhood Stroke: Results of 130 Children From a Reference Center in Central Anatolia, Turkey. *PaediatrNeurol* 2014;50:595-600.
12. Parakh M, Arora V and Khilery B. A Prospective Study Evaluating the Clinical Profile of Paediatric Stroke in Western Rajasthan. *J Neurol Disord* 2014;2:6.
13. Lych JK, Hirtz DG, DeVeber G, Nelson KB. Report of the National Institute of Neurological Disorders and Stroke Workshop on Perinatal and Childhood Stroke. *Pediatrics* 2002;109:116.

14. Rajeswari R, Burman B, Sundar JS, Ramya K. Trends in birth weight and the prevalence of low birth weight in a tertiary care hospital, Chennai. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 2015 Aug;14(8):07-13.
15. Paswan B, Singh SK, Lhungdim H, Shekhar C, Arnold F, Kishor S et al. National family health survey (NFHS-4) 2015-16: India. Mumbai: IIPS, 2017 Dec.
16. Bibi S, Gilani SYH, Shah SRA, Siddiqui TS. Childhood strokes: epidemiology, clinical features and risk factors. *J Ayub Med Coll Abbottabad* 2011 Apr-Jun;23(2).
17. Buerki S, Roellin K, Remonda L, Mercati DG, Jeannet PY. Neuroimaging in childhood arterial ischaemic stroke: evaluation of imaging modalities and aetiologies. *Developmental Medicine & Child Neurology* 2010;52:1033-1037.
18. Bigi S, Fischer U, Wehrli E, Mattle HP. Acute Ischemic Stroke in Children versus Young Adults. *Ann neurol* 2011;70:245–254.
19. Aydinli N, Tatli B, Kan MA, Zmen M, Citak A, Unuvar A, Baykal T. Stroke in Childhood: Experience in Istanbul, Turkey. *Journal of Tropical Paediatrics* 2006 Apr;52(3):158-162.
20. Salih MA, Abdel-Gader AG, Al-Jarallah AA, Kentab AY, Alorainy IA, Hassan HH et al. Stroke in Saudi children. Epidemiology, clinical features and risk factors. *Saudi Med J* 2006 Mar;27(1):S12-20.
21. Lingappa L, Varma RD, Siddaiahgari S, Konanki R. Mineralizing angiopathy with infantile basal ganglia stroke after minor trauma. *Developmental Medicine & Child Neurology* 2013, 56: 78–84.
22. Holmes JF, Palchak MJ, MacFarlane T, Kuppermann N. Performance of the Paediatric Glasgow Coma Scale in Children with Blunt Head Trauma. *Acad Emerg Med* 2005 Sep;12(9):814-9.
23. Kalita J, Goyal G, Misra UK. Experience of paediatric stroke from a tertiary medical center in North India. *Journal of the Neurological Sciences*. 2012 Nov;11-20.
24. Chung B, Wong V. Paediatric stroke among Hong Kong Chinese subjects. *Paediatrics* 2004 Aug;114(2):e206-12.
25. Higgins JJ, Kammerman LA, Fitz CR. Predictors of survival and characteristics of childhood stroke. *Neuropediatrics* 1991;22:190–3.
26. Lanthier S, Carmant L, David M, Larbrisseau A, deVeber G. Stroke in children. The coexistence of multiple risk factors predicts poor outcome. *Neurology* 2000;54:371–7.

ORIGINAL PAPER

A study of sex determination from human patellae in a tertiary care centre

Panja Saumabrata¹, Sardar Tanmay², Bose Tapas Kumar³, Roy DG⁴

Received on April 30, 2018; editorial approval June, 06, 2018

ABSTRACT

Introduction: For forensic personnel sex determination from bones is a critical factor and is commonly assessed by the morphological-metric traits of the pelvis, skull and long bones. However sometimes in cases of mass fatalities like blast injury or air- craft accidents these bones are unavailable for identification or very much fragmented. So sex prediction must be attempted from other parts of skeleton where as patella, being a sesamoid bone that forms within the tendon of the quadriceps muscle, is a robust bone and survives being fragmented which may be able to give valuable information for determination of sex of an individual. **Aims:** To find out any significant sexual differentiation between male and female by using different measurements and weight of patella of both sides. **Methods:** 187 dead bodies (96 males and 91 females) were taken for the study from representative sample of different age group & sex, keeping in mind of inclusion and exclusion criteria. **Results:** This study is in agreement with most of the previous studies and small bones also show sexual dimorphism. **Conclusion:** With the implementation of discriminant function analysis it can be concluded that we can determine sex based on patella morphometry with quite high confidence limit.

Keywords: Sesamoid bone, Dimorphism, Discriminant function analysis, Pearson's correlation, Graphical representation

INTRODUCTION

Sex determination is one of the major challenges for the forensic anthropologist. Estimation of sex is more reliable if the complete skeleton is available for analysis but in majority of forensic cases human skeletal remains are either incomplete or damaged. The use of anthropometry in the field of forensic science and medicine dates back to 1882 when Alphonse Bertillon, a French police expert invented a system of criminal

identification based on anthropometric measurements. The system of identification spread rapidly through much of the world but the system was not accepted much in view of some major drawbacks and discovery of other identification systems, e.g. dactylography.¹ The rise and development of the discipline was strongly accelerated with the publication of Wolton M. Krogman's "Guide to the Identification of Human Skeletal Material" and by significant involvement of physical anthropologists in the identification of victims from the Second World War.² Knowledge of the gender of an unknown skeletal set is essential to make a more accurate estimation of age.³ With the lack of DNA analysis, forensic anthropology applies it's knowledge with the help of artificial intelligence (ANN) based on skeletal dimorphism which give contribution in identification, particular in gender determination.⁴

The bone studied was human patellae. Now, why the sesamoid bone-PATELLA had been chosen for the study? In cases of mass fatalities like blast injury or air- craft accident, the skull, pelvis and long bones are frequently absent or fragmented, incomplete, not intact, fragmented, burned, or damaged so sex prediction must be attempted from other parts of skeleton, whereas patella forms within the tendon of the quadriceps muscle it survives being fragmented easily. Since, the shape and size of the patella relies on the strength of the muscle

Address for correspondence:

¹Demonstrator, RG Kar Medical College, Kolkata

²Assistant Professor (**Corresponding author**)

Bankura Sammilani Medical College & Hospital, Bankura

Mobile: 08777470934

Email: addicted.cyanomania@gmail.com

³Professor & HOD, Department of Forensic Medicine
NRS Medical College & Hospital, Kolkata

⁴Professor, KPC Medical College & Hospital, Kolkata
Department of Forensic Medicine

Cite this article as: Panja Saumabrata, Sardar Tanmay, Bose Tapas Kumar, Roy DG. A study of sex determination from human patellae in a tertiary care centre. *Int J Health Res Medico Leg Prae* 2018 July;4(2): 17-21. DOI 10.31741/ijhrmlp.v4.i2.2018.5

mass, it is likely that stronger muscle masses could alter the shape and size of this bone. Given that females have a smaller build than males; it can be hypothesized that some measurements of the patella will display sexual dimorphism.⁵

Aim of the study: The aim is to find out any significant sexual dimorphism between male and female by using different measurements and weight of patella of both sides.

METHODS

Study Area: F.M.T. Department and mortuary at N.R.S Medical College & Hospital, Kolkata.

Study Period: A one year study was conducted from 1st April 2015 to 31st March 2016.

Study Population: Bengalee male & female dead bodies brought to N.R.S. M.C.&H. police morgue.

Inclusion Criteria: Age group – 18 to 60 years. The age of the deceased was obtained from the nearest relatives and police and was verified by necessary documents. The age of the deceased was rounded off to full figures.

Exclusion Criteria : Diseased patella, deformed patella, fracture patella with or without mal-union or bad erosion, unknown or unclaimed dead bodies where age cannot be confirmed, Non-Bengalee population, and in those cases where consent was not given by the relatives.

Sample Size: 187 dead bodies (96 males and 91 females) were taken for the study from representative sample of different age group & sex, keeping in mind of inclusion and exclusion criteria. Out of the 2786 autopsies done within this period of time in N.R.S. Police morgue, 1418 were within the age group of 18 to 60 years, of which 957 were of Bengalee origin of which 612 cases were known cases by name & age at the time of autopsy. Excluding the deformed patella, or missing leg of any side the number of cases were 603, of which consent could be taken from only 187 cases from the nearest relative of the deceased.

Study Design: Institutional based, cross sectional, Analytical and Mortuary based study.

Study Tools: Proforma, consent form, police requisition/ inquest report, standard autopsy instruments, gloves, metallic graduated scale, hydrogen peroxide, caustic soda,⁶ and borax/ Biotex solution, instrument to boil patella in the above said solution, bristle brush & wooden chopsticks, measuring tape & slide caliper, digital camera, digital weighing machine, computer with accessories and software like MS Word and MS Excel, Windows SPSS of latest version.

Study Technique: The patellae were dissected out of both sides from each subject. During dissection care was taken to cut the skin as small as possible. Skin over the knee is sutured properly after that. Patellae thus collected were put in the instrument containing solution of either hydrogen peroxide, caustic soda or borax/Biotex solution and boiled for continuous 2 to 3 hrs so that it's get devoided of all soft tissues. Further these were washed and cleaned by rubbing with brush to get rid of any remaining soft tissue attached.⁷ At

last these processed patellae were air dried before measuring and weight taken. Length, breadth, thickness of each patella was measured by vernier caliper after correction for zeroing of the caliper was done for each case. Each patellae was weighted in digital weighing machine. Body length was noted for each case. The findings of measurements and observations were compared and statistically calculated and evaluated. Metric data was summarized as Mean and Standard deviations.

RESULT

Table 1 Distribution of the study population according to body length (n=187)

Body Length	Male		Female	
	Frequency	%	Frequency	%
4'10"	3	3.12	5	5.49
4'11"	5	5.20	9	9.9
5'	4	4.16	17	18.68
5'1"	7	7.29	8	8.8
5'2"	3	3.12	22	24.17
5'3"	5	5.20	12	8.79
5'4"	19	19.79	10	10.99
5'5"	26	27.08	3	3.29
5'6"	15	15.62	3	3.29
5'7"	6	6.25	2	2.19
5'8"	3	3.12	0	0
Total	96	100	91	100

In the study population, we got maximum number of male between body length of 5'4" to 5'6" and female between body lengths of 5' to 5'4".

Table 2 Distribution of the study population according to age group (n=187)

Age Group (Years)	Male			
	Frequency	Percentage (%)	Frequency	Percentage (%)
18-24	9	9.37	16	17.58
25-31	16	16.66	14	15.38
32-38	14	14.58	17	18.68
39-45	21	21.87	14	15.38
46-52	14	14.58	13	14.28
53-60	22	22.91	17	18.68
Total	96	100	91	100

The study comprises of 51% of male population and 49% of female population.

Table 3 Mean, Sandard Deviation & the statistical significance of various measurements of patella among male and female(*p-value significant as less than 0.05 in all the parameters)

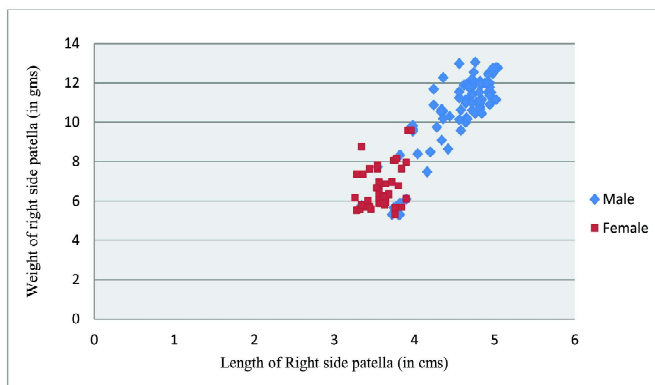
Variables(Different patellar measure)	Male		Female		P-value
	Mean	Standard Deviation	Mean	Standard Deviation	
Length- Rt.(in cms)	4.50	.435	3.59	.197	.003 *
Length- Lt. (in cms)	4.46	.428	3.55	.192	.003 *
Width- Rt. (in cms)	4.56	.398	3.69	.157	.001*
Width- Lt. (in cms)	4.55	.408	3.67	.161	.001 *
Thickness- Rt. (in cms)	2.51	.344	1.81	.171	.001 *
Thickness- Lt. (in cms)	2.51	.335	1.83	.150	.001 *
Patella weight-Rt.(in gms)	10.36	2.005	6.44	.849	.002 *
Patella weight-Lt.(in gms)	10.35	2.006	6.47	.881	.002 *

Table 4 Discriminate Function analysis done of the above variables of **Table 3**

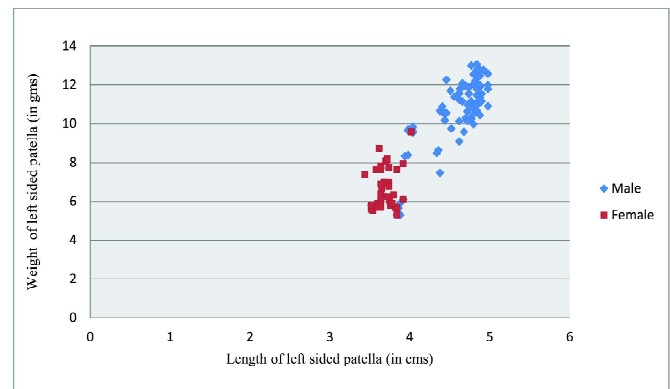
Sex		Predicted Group Membership		Total
		1	2	
Original Count	1	82	14	96
	2	2	89	91
%	1	85.4	14.6	100.0
	2	2.2	97.8	100.0

Discriminant function analysis was done to access the dimorphism in patella and how the variables correctly assign the bones to the proper sex. Computationally discriminant function analysis is very similar to analysis of variance (ANOVA), what we had read in text books.⁸ We can visualize how the two functions discriminate between groups by plotting the individual scores in graphs.⁹

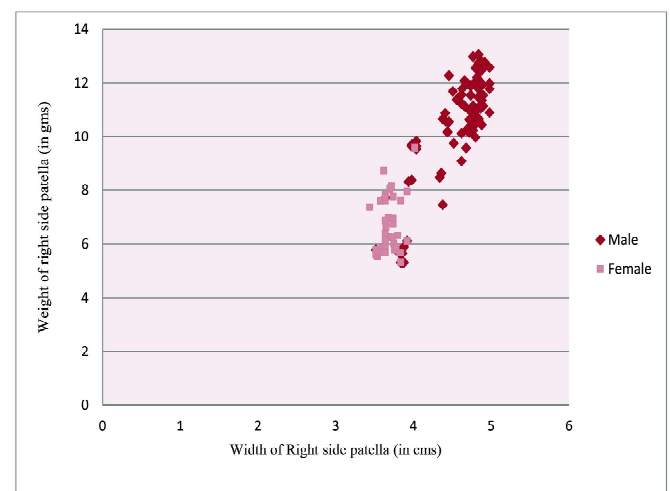
Classification result showing that Sensitivity of 97.6%, Specificity of 86.4%and Accuracy of 91.4%.

**Figure 1** Scatter diagram showing distribution of Length vs. Weight of patella-Right side in male & female

There is positive correlation and Pearson's correlation coefficient is 0.909 which is statistically significant. Pearson's correlation is the covariance of the two variables divided by the products of their standard deviations. It is a measure of value between +1 and -1, where 1 is the total correlation, 0 is no linear correlation and -1 is total negative linear correlation.

**Figure 2** Showing distribution of Length vs. Weight of patella of Left side in male and female

There is also statistically significant positive correlation coefficient of 0.910

**Figure 3** Showing distribution of width vs. weight of patella of Right side in male & female

Here also statistically significant positive correlation coefficient of 0.920. Similarly graph was plotted for searching the relation between weight and width of left sided patella and result showed positive correlation of 0.918.

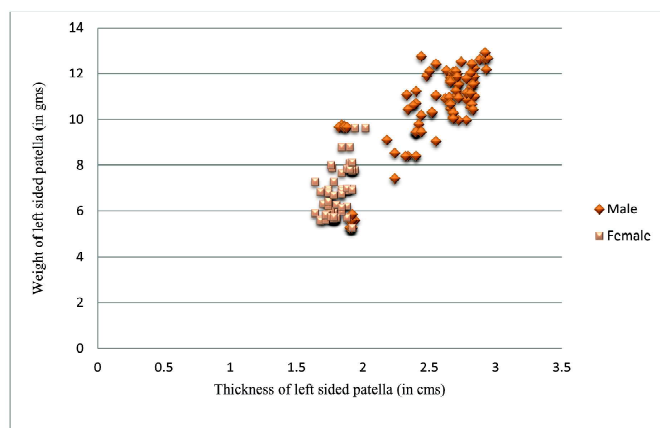


Figure 4 Showing distribution of Thickness vs. Weight-Left sided patella in male and female

Here also positive correlation and correlation co-efficient is 0.908. Similarly graph was plotted for weight and thickness of right sided patella and result showed positive correlation of 0.904.

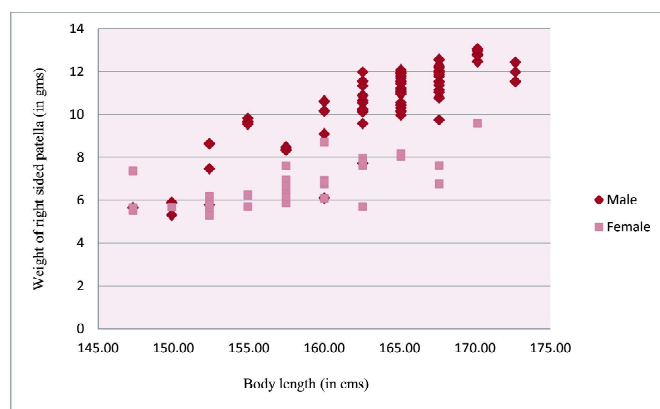


Figure 5 Showing distribution of Body length vs. weight of Right sided patella in male and female

Statistically significant positive correlation and correlation co-efficient is 0.867. Similarly graph was plotted for body length and weight of left sided patella and result showed statistically significant positive correlation of 0.870.

- No statistically significant difference between right and left side patella. Discriminant function analysis was done of the variables as p-value is significant and the results showing that Sensitivity of 97.6%, Specificity of 86.4% and Accuracy of 91.4%.
- Discriminant Function Analysis of those variables taken individually showed highest accuracy in width of 91.4%, followed by thickness of 90.6% then length 89.7% and with patellar weight of 86.3%.
- Highest correlation was found between right sided

width of patella and their weight which is 0.920 considering both male and female together.

- Lowest correlation was found between right sided patellar weight and body length of the deceased which is 0.867, considering male and female together but this is also quite strong statistically.
- It was clearly observed that most of the male patella of both sides are more than 8 gms, where as it is less than that in most of the case of females.

DISCUSSION

The results of the study reveal that we can determine sex of an individual with high confidence limit by using sesamoid bone-patella. Few previous study also emphasis on this what we have observed in our study like Kayalvizhi *et al.* conducted study in North Indian population which is in accordance with our result.¹⁰ Afrianty *et al.* conducted study on human patellae using BNPP and found result of average accuracy of 96.1%.¹¹ Olateju OI *et al.* The study was carried out on South African cadavers of European ancestry also shows sexual dimorphism.¹² Paolo Phoophalee *et al.* conducted a study on Thai population. They performed univariate and multivariate discriminant analysis.¹³ Kar MN. & Bhakta A. *et al.* conducted a study on patella in North Bengal Medical College and concluded that statistical tests shows no significant difference.¹⁴ Akhlaghi M. *et al.* found maximum accuracy in height and weight in their Iranian population study on patellae with average accuracy of 93.5%.¹⁵ Kazuhiro Sakaue study on Japanese population used patellar weight as one of the parameter but found no significant difference in their study.¹⁶ Dayal *et al.* worked on South African blacks and concluded that the highest rate of classification was 85%, thereby making the patella useful for sex determination.¹⁷ O'Connor WG. stated in the study that small bones to be recovered with high proficiency where it is unable to rescue intact long bones due to some odd situations because small bones like patella are of much help showing sexual dimorphism if studied accurately.¹⁸ Bidmos MA. conducted the study and concluded that statistically significant difference is maximum in height and breadth of patella with an average accuracy of 85% and 79% respectively.¹⁹ Magdy M. Ashmawy El-Hanafy *et al.* revealed that the measurements of male patellae were significantly higher than those of females except for the height of the medial articular surface.²⁰

CONCLUSION

The results of this study revealed that we can determine sex with high confidence in situations such as explosions, air crashes and etc, just by using the patellar measurement. The current study is in agreement with most of the previous studies and supports the idea that the small bone patella has got definitive sexual dimorphism and is a reliable indicator for sex differentiation between male and female. However like any other study this study also has its limitations like-sample size. If study could have been done on more samples there would have been lesser chance of bias in the results, correlation with other bones like pelvis, skull, mandible could

not be done. Limitation of consideration of age between 18 to 60 years, non-Bengalee population was not considered in the study. Modern analytical methods like BPNN or ANN could not be used for analysis.

Ethical clearance: Clearance of the ethical committee was obtained on 24/12/14 before the study was started.

Contributions of authors: We declare that this work was done by the authors named in the article. All of us worked as a team to design, collection of data and analysis to find out the result of the study.

Acknowledgements: All respected faculty members, all senior, junior, and co-PGTs, and all mortuary assistants for their encouragement, help and guidance in completing this work.

Conflict of interest: No conflict of interest associated with this work.

Source of funding is totally borne by the authors.

REFERENCES

1. Cattaneo C. Forensic anthropology: development of a classical discipline in the new millennium. *For Sci Int* 2007 Jan 17;165(23):185-93.
2. Bidmos MA, Gibbon VE, Strkalj G. Recent advances in sex identification of human skeletal remains in South Africa. *South African Journal of Science* 2010 Dec;106(11):1-6.
3. Macaluso PJ. The efficacy of sternal measurements for sex estimation in South African blacks. *For Sci Int* 2010 Oct 10;202(1):111.
4. Afrianty I, Nasien D, Kadir MR, Haron H. Determination of gender from pelvic bones and patella in forensic anthropology. *Proceedings of the 1st International Conference on AIMS*; 2013 Dec 3-5; Kinabalu, Malaysia.
5. Payne-James J, Busuttill A, Smock W, editors. *Forensic medicine: clinical and pathological aspects*. Cambridge University Press; 2003.p.81-3.
6. Onwuama KT, Salami SO, Ali M, Nzalak JO. Effect of different methods of bone preparation on the skeleton of the African giant pouched rat. *IntJouof Morphology* 2012 Jun 1;30(2):425-7.
7. Boyle C. Maceration and preparation of mamma skeletons for long term curation. University of Indianapolis Archeology and Forensics Laboratory.[Online]. 2010. [cited 2015 Apr 16]
8. Kemkes-Grottenthaler A. Sex determination by discriminant analysis: an evaluation of the reliability of patella measurements. *For Sci Int* 2005 Jan 29;147(2):129-33.
9. Introna Jr F, Di Vella G, Campobasso CP. Sex determination by discriminant analysis of patella measurements. *For Sci Int* 1998 Jul 6;95(1):39-45.
10. Kayalvizhi I, Arora S, Dang B, Bansal S, Narayan RK. Sex determination by applying discriminant functional analysis on patellar morphometry. *MH* 2015;42(4.8):38-41.
11. Afrianty I, Nasien D, Kadir MR, Haron H. Backpropagation Neural Network for Sex Determination from Patella in Forensic Anthropology. In *Advances in Computer Science and its Applications*. [Online]. 2014. Springer, Berlin, Heidelberg. [cited 2015 Apr 17].
12. Olateju OI, Philander I, Bidmos MA. Morphometric analysis of the patella and patellar ligament of South Africans of European ancestry. *South African Journal of Science* 2013 Jan;109(10):1-6.
13. Phoophalee P, Prasitwattanaseree S, Riengrojpitak S, Mahakkanukrauh P. Sex determination by patella measurements in Thais. *Proceedings of 1st Asian Plus Three Graduate Research Congress*; 2012 Chiang Mai, Thailand.
14. Jana TK, Giri S, Roy H, Kar M, Santra S, Das S. Patellar anthropometry in sex differentiation-a study in the northern part of West Bengal, India. *Journal of Indian Medical Association* 2013 Oct;111(10):657-60.
15. Akhlaghi M, Sheikhazadi A, Naghsh A, Dorvashi G. Identification of sex in Iranian population using patella dimensions. *Journal of forensic and legal medicine* 2010 Apr 1;17(3):150-5.
16. Sakaue K. New method for diagnosis of the sex and age at death of an adult human skeleton from the patella. *Bulletin of the National Museum of Nature and Science D* 2008;34:43-51.
17. Dayal MR, Bidmos AB. Discriminating sex in South African blacks using patella dimensions. *Journal of Forensic Science* 2005 Sep 14;50(6):306.
18. O'Connor WG. The dimorphic sesamoid: differentiating the patella of females and males by measurements. Master's thesis. University of South Carolina; 1996.
19. Bidmos MA, Steinberg N, Kuykendall KL. Patellar measurements of South African whites as sex assessors. *Journal of Comparative Human Biology* 2005 May 2;56(1):69-74.
20. Samak AM, El-Hanafy MM, Attia MM, Mishriki ES. Identification of sex from Patella in Egyptians. *Mansoura J Forensic Med-Clin Toxicol* 1999 Jul;7(2):43-55.

ORIGINAL PAPER

To evaluate knowledge and awareness of consent in medical practice amongst the medical practitioner

Wankhade Pawan A¹, Ninanve Sudhir V², Mohite PrakashM³, Patond SwapnilK⁴

Received on February 20, 2018; editorial approval on April, 20, 2018

ABSTRACT

Aim: Assessment of knowledge, awareness and current practice about consent amongst the Medical practitioners.

Objectives: To study a) the orientation regarding the various prerequisites while notifying the consent b) study current practice of obtaining consent c) present way of documenting the consent forms in medical investigative and operative procedure d) knowledge of obtaining consent in special circumstances like Medical management of Minors, operative procedures, Medicolegal autopsy, medicolegal examination of drunken persons, etc. **Materials and methods:** Cross sectional Observational study. Collective sampling method was used. Sample size: 200 RMP working in medical college were included. An elaborate questionnaire was prepared to obtain all the information incorporated in the aim and objectives of the study. **Results:** The correct responses were calculated. All the variables in the study were analyzed statistically by using HPSS software 17.0 version and Spearman's Rank order correlation coefficient. It was found that the participants are not having the required knowledge and awareness regarding consent taken in various fraternities in medical field applicable in different conditions. **Conclusion:** It can be concluded that Medical practitioners were not having required Knowledge regarding consent and awareness, regarding correct practice of obtaining consent in various circumstances c) Lack of awareness may be justified by non availability of CMEs & orientation programmes regarding information about consent and also diverse field of Participant doctors.

Keywords: Assessment, documenting, current practice, required, orientation

INTRODUCTION

The “magic” of the patient’s consent is that it transforms the status of an act from illegitimate to legitimate.¹ Both morally and legally, the patient’s right to give or withhold consent flows from his right to respect for autonomy. Although the

meaning of autonomy is debated it is not contentious to suggest that, at a minimum, autonomy requires the capacity to make a decision.² It is a general legal and ethical principle that valid consent must be obtained before starting treatment or physical investigation, or providing personal care, for a person. This principle reflects the right of patients to determine what happens to their own bodies, and is a fundamental part of good practice. A healthcare professional (or other healthcare staff) who does not respect this principle may be liable both to legal action by the patient and to action by their professional body. Employing bodies may also be liable for the actions of their staff.³ Informed consent are way of providing necessary information to the patients and helping them for decision making. All the pros and cons of procedure must be explained to the patients in the language he or she can understand. Just taking signature of patient on consent form without proper explanation and understanding of him is violating entire process of informed consent.⁴ The consent obtained, of course, after getting the relevant information will have its own parameter of operation to render protection to the medical practitioner.⁵ This study focuses on assessment of knowledge, awareness & understanding about consent and also current approach and way of obtaining consent in medical practice amongst the medical practitioners of JNMC & AVBRH, Sawangi (M), Wardha(MH).

Address for correspondence:

¹Assistant Professor

Email: drpawan9781@gmail.com

Mobile: +919422422660

²Prof and Head (**Corresponding Author**)

Email: sudhirinave@yahoo.in

Mobile: +919850736324

³Professor FMT and Vice Dean (Admin), ⁴Asst Professor Forensic Medicine Department, Jawaharlal Nehru Medical College, DMIMS (DU), Sawangi (Meghe), Wardha-442001

Cite this article as: Wankhade Pawan A, Ninanve Sudhir V, Mohite PrakashM, Patond SwapnilK. To evaluate knowledge and awareness of consent in medical practice amongst the medical practitioner. *Int J Health Res Medico Leg Prae* 2018 July;4(2): 22-26. DOI 10.31741/ijhrmlp.v4.i2.2018.6

Aim: To evaluate Knowledge and awareness of consent in Medical practice amongst the Medical practitioners.

Objectives: To review current practice of obtaining consent & the various prerequisites while notifying the consent. Analyzing the present way documenting the consent forms in medical investigative and operative procedures. To evaluate the knowledge of obtaining consent in cases of treatment of Minors, sterility procedure, consent for medicolegal autopsy, medical examination drunken persons etc.

METHODS

Only registered medical practitioners having valid MBBS/MD/MS/DM/Mch and CPS/University diploma and resident doctors were included in this study. It was Cross sectional Observational study. Purposive sampling method was used. An elaborate questionnaire was prepared to obtain all the information incorporated in the aim and objectives of the study. The written consent of the participant for participation and future publication was duly taken. All the variables in the study were analyzed statistically using HPSS software, critical evaluation of the result and interpretation was carried out.

RESULTS

Table 1 Distribution of subjects according teaching experience (yrs)

Teaching Experience (yrs)	No of subjects	Percentage (%)
1-5 yrs	142	71.0
6-10 yrs	25	12.5
11-15 yrs	33	16.5
Total	200	100
Mean±SD	4.52±3.83(1-15 years)	

In this study, 200 participants of various teaching experience were included. 142 (71.0%) participants of 1-5 years of teaching experience, 25 (12.5 %) of 6-10 years of teaching experience and 33 (16.5%) participants were having 11-15 years of teaching experience (**Figure 1**).

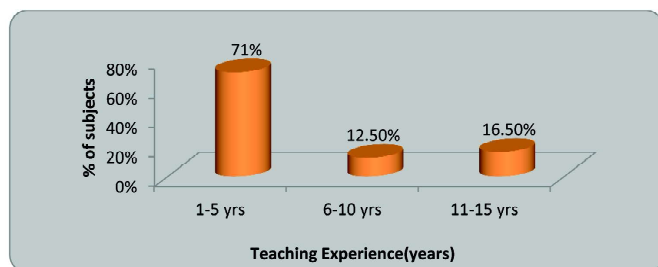


Figure 1 Distribution of subjects according to teaching experience (yrs)

Table 2(A) Analysis of Knowledge & awareness about consent

	No of subjects	Percentage (%)
Q. 1. For tubectomy operation consent of		
Only wife required	50	25
Only husband required	4	2
Both is required	138	69
Parents is required	0	0
NR	8	4
Q. 2. For surgical procedure on one spouse consent of		
Other spouse required	25	12.5
Other spouse not required	2	1
Both is required	169	84.5
Parents is required	0	0
NR	4	2
Q. 3. Patient can be discharged against DAMA by taking		
Implied consent	2	1
Written informed consent with signature	160	80
Police Permission	12	6
No formally required	13	6.5
NR	13	6.5
Q. 4. To remove eyes after death consent of		
Relatives required	2	1
Guardian required	21	10.5
Either A or B	58	29
Deceased already given the consent	117	58.5
NR	2	1
Q. 5. A patient can give valid consent for medical surgical procedure at the end		
Above 12 yrs	32	16
Above 15 yrs	10	5
Above 21 yrs	21	10.5
Above 18 yrs	127	63.5
NR	10	5

Table 2(B) Analysis of Knowledge & awareness about consent

	No of subjects	Percentage (%)
Q. 6. In drunken person without consent		
Examination can be done	20	10
Blood and urine for alcohol estimation can be taken	35	17.5
Only treatment can be done	23	11.5
All A,B,C can be done	113	56.5
NR	9	4.5

Q. 7. In rape victim, examination can be done		
Without consent	1	0.5
Only with consent	153	76.5
With permission of police	42	21
With consent of relatives	1	0.5
NR	3	1.5
Q. 8. If rape victim not willing to inform the police then		
Police not informed	31	15.5
Informed	20	10
Informed and not examined without consent	122	61
None	16	8
NR	11	5.5
Q. 9. For home visit		
Expressed consent required	59	29.5
No consent required	116	58
Informed consent required	0	0
Patient signature required	16	8
NR	9	4.5
Q. 10. In unexplained death for postmortem consent of		
Relatives is must	95	47.5
In laws is must	31	15.5
Hospital administration is must	23	11.5
No consent is required	47	23.5
NR	4	2

Note - NR: Not replied

In **Table 2(A)**, to the question of, for tubectomy operation consent of, only wife required which is incorrect answer was given by 50 (25%) of participants, only Husband required which is incorrect answer was given by 4(2%) of participants, both is required which is **correct answer** was given by 138 (69%) of participants.

To the question of, for surgical procedure on one spouse consent of, Other spouse required, which is incorrect answer was given by 25(12.5%) of participants, Other spouse not required, which is **correct answer** was given **only by 2(1%)** of participants, both is required, which is incorrect answer was given by 69(34.5%) of participants.

To the question of, patient can be discharged against medical advice (DAMA) by taking, implied consent, which is incorrect answer was given by 2(1%) of participants, written informed consent with signature, which is **correct answer** was given by 160(80%) of participants, Police permission, which is incorrect answer was given by 12(12%) of participants, no formality required, which is incorrect answer was given by 13(6.5%) of participants.

To the question of, to remove eyes after death for eye donation

consent of Relatives (Legal Heirs) required, which is **correct answer** was given by **2(1%)** of participants, guardian required, which is incorrect answer was given by 21(10.5%) of participants, either a or b, which is incorrect answer was given by 58(29%) of participants, deceased already given the consent, which is incorrect answer was given by 117(58.5%) of participants.

To the question of, a patient can give valid consent for major surgical procedure at the age of above 12 years, which is incorrect answer was given by 32(16%) of participants, above 15 years, which is incorrect answer was given by 10(5%) of participants, above 21 years, which is incorrect answer was given by 21(10.5%) of participants, above 18 years, which is **correct answer** was given by **127(63.5%)** of participants,

In **Table 2(B)**, to the question of, in drunken person without consent, examination can be done which is incorrect answer was given by 20(10%) of participants, blood & urine for alcohol estimation can be taken, which is incorrect answer was given by 35(17.5%) of participants, Only treatment can be done, which is **correct answer** was given by 23(11.5%) of participants, All a,b,c can be done, which is incorrect answer was given by 113(56%.5) of participants.

To the question of, in rape victim, examination can be done, Without consent of victim, which is incorrect answer was given by 1(0.5%) of participants, only with consent of victim, which is **correct answer** was given by 153(76.5%) of participants, with permission of police, which is incorrect answer was given by 42(21%) of participants, with consent of relatives, which is incorrect answer was given by 1(0.5%) of participants.

To the question of, if rape victim is not willing to inform the police then Police not informed, which is incorrect answer was given by 31(15.5%) of participants, Informed, which is incorrect answer was given by 20(10%) of participants, informed & not examined without consent, which is **correct answer** was given by **122(61%)** of participants, None, which is incorrect answer was given by 16(8%) of participants.

To the question of, for treatment in home visit, expressed consent required, which is incorrect answer was given by 59(29.5%) of participants, no consent required, which is **correct answer** was given by 116(58%) of participants, Informed consent required, which is incorrect answer was given by 0(0 %) of participants, Patients signature required, which is incorrect answer was given by 16(8 %) of participants.

To the question of, in unexplained death for medicolegal postmortem examination consent of, relatives is must, which is incorrect answer was given by 95(47.5%) of participants, In Laws is must, which is incorrect answer was given by 31(15.5%) of participants, hospital administration is must, which is incorrect answer was given by 23(11.5%) of participants, no consent is required, which is **correct answer** was given by 47 (23.5%) of participants.

Table 3 Age wise distribution of correct responses of students

Questions	21-30 yrs		31-40 yrs		41-50 yrs		Total	x ² -value	p-value
	F	%	F	%	F	%			
Q1	62	31	61	30.5	14	7	137	1.60	0.44,NS
Q2	30	15	23	11.5	8	4	61	2.43	0.29,NS
Q3	69	34.5	72	36	19	9.5	160	0.34	0.84,NS
Q4	10	5	11	5.5	0	0	21	3.05	0.21,NS
Q5	60	30	54	27	13	6.5	127	3.24	0.19,NS
Q6	17	8.5	7	3.5	3	1.5	23	2.62	0.26,NS
Q7	61	30.5	72	36	20	10	153	2.61	0.27,NS
Q8	52	26	58	29	12	6	122	0.91	0.63,NS
Q9	49	24.5	56	28	12	6	117	0.61	0.73,NS
Q10	19	9.5	21	10.5	7	3.5	47	0.70	0.70,NS

No significant age wise difference is observed in the participants about knowledge and awareness of consent.

DISCUSSION

Very few studies have been undertaken to assess the knowledge and awareness of medical practitioners about consent in medical practice. With the advancement of medical field, the need of authentic medical documentation and there by legally valid consent is increasing which is highly demanded for ethical medical practice and to stay protected from untoward legal petitions. According, literature available and KSN Reddy⁶ and OV Nandimath⁷ it is observed that in many question the Medical practioners have given incorrect responses.

In **Table 2(A)**, Q.No.2 it is observed that, most of the participants are unaware of the fact that for surgical procedure consent of one of the spouse is required who is major and operation is not involving reproductive organs by comparing with the available literature.⁸ In **Table 2(A)**, Q.No.4 it is observed that, most of the participants are unaware of the fact that for removing the eyes of the person after his death, consent of legal heirs is required though the deceased have consented for eye donation in his life.⁹ In **Table 2(B)**, Q.No 6 it is observed that, most of the participants are unaware of the fact that, only treatment can be done in drunken person without his consent unless the person is involved in criminal activity.¹⁰ In **Table 2(B)**, Q.No 10 it is observed that, most of the participants are unaware of the fact that, no consent is necessary for medico legal postmortem as it is ordered and demanded by the law enforcing agencies as per Section 174 Cr.PC.¹¹

In a study it is reflected that 'there is a wide gap between actual concept of informed consent and perceptions of patients for the same. Patient awareness programs must be conducted by appropriate authority with help of media and television to improve their knowledge and preserve their rights.⁴ A study revealed that, most of the patients want to aware of their legal and ethical rights but proper guidance and availability of hands on information is lacking. Before any procedure patient must know reason, benefits, risk, alternative procedure, its risk and benefits, limitations after procedure and cost of procedure.¹² In the present study the same facts are studied. A knowledgeable and wise doctor can guide the patients properly while documenting the consent

before any intended medical procedure. Derivations in present study comply with the other several studies that have shown that written information in the language patients can understand has beneficial effects. Patient information sheet in vernacular language must be necessary before obtaining their informed consent.^{13, 14} Some patients stated that doctor must take decision on behalf of them and take all responsibility.¹⁵ All these facts should be noted by the doctors while documenting the consent for medical procedures.

CONCLUSION

From the above study it can be concluded that medical practitioners are somewhat lacking the thorough knowledge & awareness regarding consent applicable in various medical conditions. No age wise or designation wise difference was observed in Knowledge and awareness about consent. Lack of awareness may be justified by non availability of CMEs & orientation programmes regarding amendments in rules of consent and also diverse field of Participants. In India there is no uniformity in proforma of the forms required for documenting the various medicolegal cases and also valid consent forms printed in local language are not presently available in government, private hospital and corporate hospital in Urban areas. Reasonably it can be concluded that in rural hospitals of the country the importance and awareness in documenting valid consent must be pathetic. In recent decades there has been tremendous increase in the use of technology in various fields of Medicine like radiology, Genetics, Infertility treatment. This has again raised the complexities in documenting valid consent in various diagnostic and therapeutic procedures. So, to cope with that, over whole orientation of all the medical professionals is direly needed. This will protect the innocent and honest Doctors in courts of Laws in the event of Law suits. Professional organizations like IMA, IAFM, IJHRMLP etc should be keen enough to undertake the training of every practicing doctor so as to become well versed with the various practical aspects of consent. Recommendation based on the study can be utilized to improve the quality of health care and Medical documentation. Regular CMEs, Workshops and research publications are required so as to upkeep the knowledge and awareness about consent.

Conflict of interest: None declared.

Ethical clearance: Taken.

Source of funding: Nil.

Author contribution: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Hurd HM, Alexander L. The moral magic of consent. *Legal Theory* 1996;2:121–46.
2. A R Maclean: Consent, sectionalisation and the concept of a medical procedure. *J Med Ethics* 2002;28:249-254.
3. Reference Guide to Consent for Examination or Treatment. Introduction. London: Department of Health UK; 2009. [cited 2018 May 10]; Available from: URL: www.dh.gov.uk/consent
4. Parmar P, Rathod GB, Rathod S, Parikh A. Consent in medical practice – Perceptions of patients towards legal aspects of informed consent. *IAIM* 2016;3(4):105-110.
5. Maneka Gandhi v Union of India. 1978 AIR 597. [cited 2018 May 10]; Available from: URL: <https://indiankanoon.org/doc/1766147/>
6. Reddy KSN. Medical Law and ethics- Consent in Medical practice, In the Essentials of Forensic Medicine and Toxicology. 29th ed. Hyderabad: K. Suguna Devi; 2009. p. 20-50.
7. Nandimath OV. Consent and medical treatment: The legal paradigm in India. *Indian J Urol* 2009;25:343-7.
8. Indian Penal Code 1860, s.91
9. The Transplantation of Human Organs Rules 1995 {As amended vide GSR 571(E), dt.31-7-2008}, s. (24)(1)(4)(2)(A)
10. Indian Penal Code 1860, s.90
11. Criminal Procedure Code (1973), s.174
12. Bates T. Ethics of consent to surgical treatment. *Br J Surg* 2001;88:1283-1284.
13. Askew G, Pearson KW, Cryer D. Informed consent: can we educate patients? *J R Coll Surg Edinb* 1990;35: 308- 310.
14. Lewis PJ, O’Keefe L, Adcock S. Patients who were given information sheets has better postoperative recall of information [letter]. *J R Coll Surg Edinb* 1991;36:206-207.
15. Deher R. Physicians in healthcare management: The patient-physician partnership: decision making, problem solving and the desire to participate. *Can Med Assoc J* 1994;154:423–7.

ORIGINAL PAPER

Effectiveness of information booklet on knowledge regarding acute respiratory infection among mothers

Hijam Sonia¹, Dutta Arunjoyoti²

Received on April 27, 2018; editorial approval on May 30, 2018

ABSTRACT

Introduction: Acute respiratory infection (ARI) is a serious **infection** that prevents normal breathing function.

Objective: To evaluate the effectiveness of information booklet on knowledge regarding acute respiratory infection among mothers of fewer than five children. **Methods:** A pre - experimental design (one group pre test post test design) was undertaken in Dhirenpara, Guhawati, Assam. 60 mothers of under five children and purposive sampling technique was used. Pre-test knowledge was checked with structured questionnaires followed by distribution of information booklet and post test were conducted after 7 days. **Results:** Out of 60 mothers in pre-test knowledge, 15(25%) had inadequate knowledge, 30(50%) had moderately adequate knowledge and another 15(25%) mothers had adequate knowledge. After administration of information booklet during post test majority 48(80%) mothers had adequate knowledge, 12(20%) mothers had moderately adequate knowledge regarding ARI. The mean knowledge score in pre test was 11.56 with SD 4.33 and mean post test score was 17.43 with SD 2.83. The calculated value of "Z" is 8.89 which was higher than the tabulated value 2.33 at 0.01 level of significant. **Conclusion:** The information booklet was effective in increasing the knowledge on acute respiratory infection of mothers of fewer than five children

Keywords: Quasi experimental study, assess, urban community, under five children

INTRODUCTION

Children are the foundation of a nation; they contribute effectively in the nation building process.¹ Many children die before they could reach five year of age. In India about 27 million children are born each year out of which nearly 2 million of them die before the age of five years. Acute respiratory infections are one of the leading cause of child mortality (30%) in India.² Because of the high morbidity and

mortality rate ARI poses a major challenge to the health system in developing countries.³

In India (2011), about 26.3 million cases of ARI were reported, with an incidence rate of about 2,173 cases per lakh population. In Indian slums, more than two-third of all childhood illness are due to ARI. Hospital records from states with high infant mortality rate shows that upto 13% of inpatient deaths in wards are due to ARI.⁴

National Family Health Survey (NFHS-3) revealed that the percentage of children with ARI symptoms varies greatly by state, 1 % in Himachal Pradesh, 13 % in West Bengal, 14 % in Tripura and 7.3% in Assam.⁵ A study revealed that formal education of mothers had a positive influence on care of their children with acute respiratory tract infections. So it can be observed from other reviews that mother's illiteracy is one of the risk factors of respiratory tract infection in children.⁶

The child rearing practices play an important role in determining the health of children. Today information about prevention and health promotion are considered essential components of comprehensive health care. Since "Prevention is better than cure" giving information and involving the parents in the caring for the sick child will minimize complications.

Objectives: 1. To assess the knowledge of mother of under five children regarding acute respiratory infection before and

Address for correspondence:

¹Sister Tutor

International hospital, College of Nursing

Email: hijamsonia33@gmail.com

Mobile: +918638481789

²Assistant Professor (**Corresponding Author**)

Asian Institute of Nursing Education

Email: arunjoyoti.dutta@gmail.com

Mobile: +919854005528

Cite this article as: Hijam Sonia, Dutta Arunjoyoti. Effectiveness of information booklet on knowledge regarding acute respiratory infection among mothers. *Int J Health Res Medico Leg Prae* 2018 July;4(2):27-30. DOI 10.31741/ijhrmlp.v4.i2.2018.7

after providing information booklet. **2.** To evaluate the effectiveness of information booklet regarding acute respiratory infection of under five children among mothers. **3.** To determine the association between the pre test knowledge and selected demographic variables like age, educational qualification, number of children and type of family.

METHODOLOGY

Hypothesis: H1: The mean post test knowledge score of the mothers will be significantly higher than the mean pre test knowledge score of the mothers regarding acute respiratory infection after distribution of information booklet.

A Pre experimental design (one group pre test post test design) was used to assess the effectiveness of information booklet on knowledge regarding acute respiratory infection of under five children among mothers. The study was conducted in Dhirenpara, Guwahati, Assam. In this study, the sample were 60 mothers of under five children in selected urban community of Guwahati who fulfil the inclusion criteria. The researcher used the purposive sampling technique. A structured questionnaire was used to assess the knowledge of mothers regarding acute respiratory infection of under five children. A structured questionnaire was developed to assess the level of knowledge among mothers of under five children on acute respiratory infection. The information booklet on acute respiratory infection was developed. Contents organised in different aspect like: introduction to acute respiratory infection, risk factors, causes, routes of transmission, signs and symptoms, complication, treatment and prevention of ARI. The draft was validated by experts comprising of seven nursing experts, three medical experts. The tools used for the study consisted of two section:

Section I Demographic variables

It consisted of age of mother, educational qualification of mother, occupation of mother, number of children, type of family, monthly family income, housing type, type of fuel used for cooking, history of smoking by mother, history of smoking by father and previous knowledge.

Section II Structured questionnaire to assess knowledge regarding acute respiratory infection

It consists of 24 questions related to knowledge about acute respiratory infection, its risk factors, signs and symptoms, danger signs, management and prevention.

The correct answer was given score '1' (one) and wrong answer score '0' (zero). The total score on knowledge regarding acute respiratory infection was 24.

The knowledge score was interpreted as,

<33%= inadequate knowledge

33% -66%= moderately adequate knowledge

>66%= adequate knowledge

The reliability of the tools was done by Split Half method. Findings of the study revealed that the tool was found to be reliable. The reliability of knowledge was 0.88. Before starting

the final data collection procedure for the present study; the investigator obtained permission from the Ethical Committee INS Trust, (GNRC), Dispur, Guwahati, Assam. Permission was taken from concerned authority of selected urban community to carry out the study. The data collection period was scheduled from 4th to 30th July 2016. A brief self-introduction and purpose of the study was explained to the sample prior to data collection and keeping in mind the ethical aspect of research, data was collected after obtaining informed consent of the sample for their willingness to participate in the study. A pre- test was conducted by administration of structured questionnaire to assess the knowledge regarding acute respiratory infection by using self-report technique. The respondents were given 25-30 minute to complete the questionnaires. On the same day after pre test information booklet regarding acute respiratory infection was provided to the sample. The post-test was conducted by using the same structured questionnaire on 7th day of introduction of information booklet. The data analysis was consisted of descriptive and inferential statistics.

RESULTS

The data were grouped and analysed under the following sections

Section I Frequency and percentage distribution of mothers according to demographic characteristics.

A total of 60 mothers responded for the study. Out of 60 respondents majority of mothers i.e, 30(50%) belonged to 25-30 age group, 30(50%) respondents had primary level of educational status, 54(90%) were housewives, 26(43%) had only one child, 29(48%) belongs to nuclear family, 46(77%) had a family income of less than Rs10,000, 23(38%) were living in kutchha house, 51(85%) uses gas for cooking, 36(60%) had a history of smoking by father at home, 54(90%) mothers do not have history of smoking, 33(55%) mothers do not have any previous knowledge on ARI, 14(52%) mothers have received the information about ARI through health personnel.

Section II Knowledge on acute respiratory infection before and after distribution of information booklet

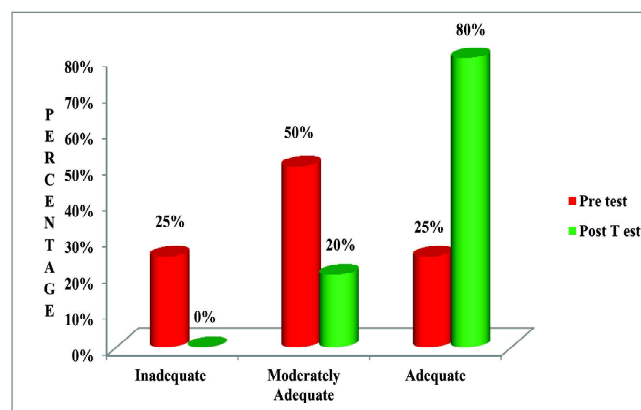


Figure 1 Distribution of mothers according to their level of knowledge

The data presented in figure 1 depicts that out of 60 mothers in pre test, 15(25%) had inadequate knowledge, 30(50%) had moderately adequate knowledge and another 15(25%) mothers had adequate knowledge. After administration of information booklet during post test, 48(80%) mothers had adequate knowledge, 12(20%) mothers had moderately adequate knowledge and no one had inadequate knowledge regarding acute respiratory infection.

Table 1 Knowledge of mothers regarding acute respiratory infection

Aspect	Mean	Standard deviation (SD)	Range of score	Total Score
Pre-test knowledge	11.56	4.33	4 – 18	24
Post-test knowledge	17.43	2.83	9 – 21	24

Overall knowledge of the mothers before and after administration of information booklet with mean score 11.56, SD score was 4.33 and range of score was from 4 - 18 during pre test. Mean score was 17.43, SD score was 2.83 and range of score was from 9 - 21 during post test.

Section III Evaluation of effectiveness of information booklet on knowledge regarding acute respiratory infection of under five among mothers

Table 2 Evaluation of effectiveness of information booklet

Knowledge	Mean	SD	Z-value	P- value	Table value
Pre test	11.56	4.33			
Post test	17.43	2.83	8.89	0.01	2.33

The **table 2** depicts that the mean knowledge score in pre test was 11.56 with SD 4.33 and mean post test score was 17.43 with SD 2.83. The improvement was statistically tested by “Z” test. The calculated value of “Z” is 8.89 which was higher than the tabulated value 2.33 at 0.01 level of significance. It indicates that the mean post test knowledge is significantly higher than the mean pre test knowledge. Hence, the information booklet on acute respiratory infection is effective.

Section IV Association of pre test knowledge with selected demographic variables

The study showed that there was no significant association between pre test knowledge score and selected demographic variables.

Age: The calculated value was 4.04 and the tabulated value was 5.99 at 0.05 level of significance. Since the calculated value was less than the tabulated value there was no significant association between pre test knowledge and age.

Educational qualification: The calculated value was 0.12 and the tabulated value was 5.99 at 0.05 level of significance. Since the calculated value was less than the tabulated value there was no significant association between pre test knowledge and educational qualification.

Number of children: The calculated value was 0.76 and the tabulated value was 5.99 at 0.05 level of significance. Since the calculated value was less than the tabulated value there was no significant association between pre test knowledge and number of children.

Type of family: The calculated value was 0.78 and the tabulated value was 5.99 at 0.05 level of significance. Since the calculated value was less than the tabulated value there was no significant association between pre test knowledge and type of family.

DISCUSSION

The first objective was to assess the knowledge of mother of under five children regarding acute respiratory infection before and after providing information booklet

In pre-test knowledge, out of sixty mothers, 30(50%) mothers had moderately adequate knowledge on acute respiratory infection, and 15(25%) mothers had adequate knowledge and 15(25%) mothers had inadequate knowledge. In post- test knowledge, out of sixty mothers 48(80%) mothers had adequate knowledge and 12(20%) mothers had moderately adequate knowledge.

The present study was supported by the study conducted by Meena Gyawali *et al.*⁷ and it was found that 77.9% of women had no opportunity to take part in any training related to ARI. Statistically significant relationship was found on level of knowledge with education of mother ($p=0.002$). Study revealed that 83.9% of respondent had satisfactory level of knowledge and 10.7% had poor level of knowledge and only 5.5% had excellent level of knowledge regarding ARI. Similar findings were reported by Joseph Jophin and George Jyothy⁸, who found the mothers had inadequate knowledge with a mean of 29.25% and standard deviation of 2.26 in pre test where as in post test there was a significant mean knowledge gain of 77.77% and standard deviation of 1.68.

The second objective was to assess the effectiveness of information booklet regarding acute respiratory infection of fewer than five children among mothers.

The improvement was statistically tested by “Z” test. The calculated value of “Z” is 8.89 which is higher than the tabulated value 1.645 at 0.01 % level of significance. It indicates that the mean post test knowledge is significantly higher than the mean pre test knowledge. Hence the information booklet on acute respiratory infection is effective.

A similar study was conducted by Jena Mamata⁹ to evaluate the effectiveness of information booklet on knowledge and practice about prevention of pneumonia among mothers of fewer than five children. The study was conducted on 50 mothers and it shows that 52% of mothers had no knowledge regarding prevention of pneumonia. The ‘t’ value for knowledge and practice test are 35.78 and 14.68 respectively which are much greater than calculated t value at 0.05 significance level (2.01) in both indicating effectiveness of information booklet in increasing knowledge & knowledge on practice.

The present study supported by Sachin Mali¹⁰ and the findings of the study showed that none of the mothers from both the groups had adequate knowledge score in the pre test. Overall pre tests mean knowledge scores of Control and Experimental group was 42.2% and 48.8%. The obtained 't' value was 0.29 is statistically non-significant at $p > 0.05$ level. Overall post-test mean knowledge scores of control and experimental was 49.1% and 79.7%. The obtained 't' value is 16.78 is statistically significant at $p < 0.05$ level.

The third objective was to find out association between the pre-test knowledge and selected demographic variables.

In the present study there is no significant association between pre-test knowledge score and selected demography like age, educational qualification, number of children and type of family.

A similar study conducted by Meena Gyawali, Rama Pahari, Safala Maharjan and Ravi Roshan Khadka⁷ and study found that there was no association between knowledge on ARI and demographic variables like age of mother and occupation.

CONCLUSION

Majority of the mothers i.e. 30(50%) had moderately adequate knowledge on acute respiratory infection, 15(25%) mothers had adequate and 15(25%) mothers had inadequate knowledge before administering of information booklet regarding acute respiratory infection. Majority of the mothers i.e. 48(80%) had adequate knowledge and 12(20%) mothers had moderately adequate knowledge after administering of information booklet regarding acute respiratory infection. The mean of knowledge before and after intervention were 11.56 and 17.43 respectively. The information booklet was proved effective as tested by Z test at 0.01 level of significance as the calculated value of "Z" of knowledge was 8.89 was highly significant at 0.01% level. So, it signifies that the information booklet was effective as it increases the post-test level of knowledge. There was no significant association of knowledge and selected demography of the under-five mothers. The study concluded that the information booklet was effective in increasing the knowledge on acute respiratory infection of mothers of fewer than five children.

Acknowledgement: We owe our sincere gratitude to the staff those who involved directly and indirectly during this study. Our sincere thanks to all the participants.

Conflict of interest: None declared.

Ethical clearance: Taken.

Source of funding: None declared.

Declaration: The article is original with the author(s) and does not infringe or violate any other right of any third parties. The article has not been published (whole or in part) elsewhere, and is not being considered for publication

elsewhere in any form, except as provided herein. All authors have contributed sufficiently in the article to take public responsibility for it. All authors have reviewed the final version of the above manuscript and approve it for publication.

REFERENCE

1. Gupte Suraj. The short textbook of paediatric. 11th ed. New Delhi: Jaypee brothers medical publisher (P) Ltd ; 2009. p.15-18.
2. PM Udani. The textbook of pediatric. 1st ed. New Delhi: Jaypee brothers medical publisher (P) Ltd; 1991. p.127.
3. Kumar S Ganesh, Majumdar Anindo, Veera, Kumar Bijay. Prevalence of acute respiratory infection among under-five children in urban and rural areas of puducherry. India. Child Health Mini Series 2015;6(1):3–6.
4. JL Mathew, AK Patwari, P Gupta. Acute respiratory infection and pneumonia in India: a systematic review of literature for advocacy and action: UNICEF-PHFI series on newborn and child health, India. NCBI 2011;48(3):198-121.
5. M Taksande Amar, Yeole Mayuri. Risk factor of acute respiratory infection (ARI) in under-fives in a rural hospital of central India. Journal of Pediatric and Neonatal Individual Medicine 2015;5(1):1-6.
6. Sharma Dhananjaya, Kuppasamy Kumaresan, Bhoorasamy Ashok. Prevalence of acute respiratory infections and their determinants in fewer than five children in urban and rural areas of Kancheepuram district, South India. Annals Of Tropical Medicine and Public Health 2013;6(5)513–518.
7. Gyawali Meena, Pahari Rama, Maharjan Safala, Khadka Ravi Roshan. Knowledge on acute respiratory infection among mothers of fewer than five year children of Bhaktapur District, Nepal. Intl J of Sci and Res Publication 2016;6(2):85–89.
8. Joseph Jophin, George Jyothy. A study to assess the effectiveness of structured teaching programme regarding knowledge on prevention of upper respiratory tract infection among mothers of toddler in selected hospital, Bangalore. International Journal of Science and Research 2015;4(12):1913-1917.
9. Jena Mamata. Effectiveness of information booklet on knowledge and practice about prevention of pneumonia among mothers of fewer than five children. IOSR Journal of Nursing and Health Service 2014;3(1)25-30.
10. Mali Sachin. Effectiveness Of Structured Teaching Programme On Knowledge Of Mothers Of Under Five Children On Domiciliary Management and Prevention Of Upper Respiratory Infection. Sinhgad e Journal of Nursing 2012;2(2):44-47.

ORIGINAL PAPER

Prevalence and correlates of dementia among the community-dwelling elderly of Guwahati City, Assam

Saikia AM¹, Mahanta Neelakshi², Mahanta Ajaya³, Deka Himamoni⁴, Boruah Beeva⁵

Received on April 10, 2018; editorial approval on June 15, 2018

ABSTRACT

Background: Dementia is a major cause of disability in elderly population. But this issue is yet to get due attention and priority. This is mainly due to absence of valid statistics, inadequate documentation and lack of well validated screening tool. There is absolute dearth of information on dementia prevalence among community dwelling elderly in this North East region of the country. **Objectives:** To assess the prevalence of dementia among community dwelling elderly of Guwahati City and to find out the various correlates of dementia. **Materials and Methods:** This was a community based cross-sectional study conducted in ten (10) randomly selected wards of Guwahati city. Data collection was done by house to house visit after selection of first house randomly. Elderly fulfilling inclusion criteria were screened with vernacular adaptation of Hindi Mini Mental State (HMMSE) and Early Dementia Questionnaire (EDQ). Pre-designed and pretested schedule was used to collect information on demographic profile, socioeconomic status, living status, and financial status, type of diet, smoking, use of alcohol and social and leisure engagement. **Results:** The prevalence of dementia on EDQ was found to be 11.25% and 1.25% on HMMSE. Age, gender, socioeconomic status, education, social and leisure engagement was found to be significantly associated with dementia. **Conclusion:** The high prevalence in the present study can be an eye opener for researcher to do further study with larger sample size. This definitely helps the planner for development of effective strategies.

Keywords: Dementia, Elderly, Early Dementia Questionnaire, Hindi Mini Mental State Examination

INTRODUCTION

With population ageing, dementia becomes an important public health problem, particularly in developing countries. According to the Alzheimer's disease International (ADI) Delphi consensus study, by 2040, 71% of all people with dementia

will be living in developing countries. It is estimated that there are about 0.5 million cases with dementia in India. This number is likely to increase by 300% in the next four decades.¹

Dementia often goes unrecognised or misdiagnosed in its early stages. In Indian scenario, forgetfulness in the elderly is often recognised as normal variation of ageing. When it is recognised, it is often in advanced stage.² However, different studies found that other than loss of memories, the early signs of dementia could also be disturbance of daily functioning, fixation on emotional events and disturbance of day-night rhythm as presentations.^{3,4,5} Various tools have been developed for cognitive screening, although no single instrument is suitable for global use.⁶ Although Mini Mental State Examination (MMSE) is widely accepted test for cognitive decline,⁷ the weakness of the MMSE lies in its varying accuracy in patients of different ages, education levels, and ethnicities.^{8,9} So, a Hindi-version of MMSE (HMMSE) has been developed for use in India.¹⁰

Identifying individuals at an early stage of cognitive dysfunction is desirable for both treatment and research purpose.¹¹ "Early Dementia Questionnaire (EDQ)" is more sensitive tool for detection of early dementia as compared to MMSE.¹² There is absence of information regarding the magnitude of the problem in the North-East region of the

Address for correspondence:

¹Professor, Department of Community Medicine
Email: drankumonisaikia@rediffmail.com
Mobile: +919435016507

²Associate Professor (**Corresponding Author**)
Department of Medicine
Email: neelakshimahanta@gmail.com

³Ex-Professor & HOD Department of Neurology

⁴Assistant Professor, Department of Anatomy
Gauhati Medical College, Guwahati, Assam

⁵Professor & HOD, Department of Community Medicine, FAA Medical College

Cite this article as: Saikia AM, Mahanta Neelakshi, Mahanta Ajaya, Deka Himamoni, Boruah Beeva. Prevalence and correlates of dementia among the community-dwelling elderly of Guwahati City, Assam. *Int J Health Res Medico Leg Prae* 2018 July;4(2):31-34. DOI 10.31741/ijhrmlp.v4.i2.2018.8

country. The present study was undertaken to assess the prevalence of dementia and also to study the different factors associated with it.

MATERIALS AND METHODS

This community based cross sectional study was conducted from 1st June 2013 to 30th September'13. Elderly above the age of 60 years and those who were willing to participate were included in the study. Informed consent was obtained from the elderly and also from the caregiver as and when necessary. Subjects included in the study were first screened for depression using 15 Geriatric Depression Scale (15GDS). Elders who were found to score >5 on 15GDS were excluded. Necessary referral was advised for subjects having depression. Severe head injury, brain neoplasm known psychiatric illness, critically ill elderly, and elderly with severe hearing or speech impairment were also excluded from the study. Necessary approval was obtained from Institutional Ethics Committee. As there has been absolute dearth of data from this part of the country and a wide range of variation of prevalence exists across the country, sample size was calculated considering P as 0.5.¹³ Applying the formula $4PQ/L^2$, allowable error as 10% of prevalence, the sample size was calculated as 400. From 31 municipality wards of Guwahati city, 10 wards were selected randomly and from each ward 40 elderly were interviewed. The first house in the ward was selected randomly. After that, door to door survey was conducted in the selected ward to identify the residents aged 60 years and above. Face to face interview was conducted for the elderly fulfilling the inclusion criteria. Vernacular adaptation of Hindi Mini Mental State Examination (HMMSE) was used for screening of dementia. This tool was translated to vernacular medium by one bilingual expert and again translated back to Hindi by another bilingual expert and one bilingual investigator compare the two for any discrepancy. This was done to check the integrity of translation. We modified the tool by replacing the questions on villages by the same questions on ward/area. We considered the cut off as less than or equal to 23. Both HMMSE and adopted version were applied to 10 bilingual subjects who were not part of the original study for validation of the tool. Subjects were also administered EDQ. While using EDQ, information was also obtained from an informant, usually the subject's next of kin. This tool was also translated to the local language. Score above 8 on EDQ has been considered as early cognitive decline or early dementia. No attempt was made to assess the type of dementia. A predesigned and pretested schedule was used to collect information on following factors -demographic profile, living status, financial and functional status, type of diet, smoking, alcohol use and social and leisure engagement. Modified Kuppaswamy scale was used for assessment of socioeconomic status. An operational definition of social and leisure engagement was made. Participating in community, religious or social gatherings, engaging in physical exercises/ yoga/meditation, engagement in their hobbies, participating in household activities in their leisure time have been

considered as social or leisure engagement. The information obtained from the participants regarding their social and leisure engagement was further verified with the first informant, in case of discrepancy, information was sought from another informant of the family or neighbourhood. Financially independent elders have been defined as those who had one or other means of current income which was sufficient for self-maintenance. Elderly taking vegetarian diet for at least last 6 months were considered as vegetarian and vice versa. For the study purpose, elders have been classified as smokers, non-smokers and ex-smokers. Ex-smokers have been defined as those who have smoked less than 100 cigarettes during their life time and then quit. For studying the relationship between smoking and dementia, ex-smokers were not considered. Regarding use of alcohol, respondents were categorized as ever user and never user. Ever users were further classified based on frequency of use. The amount and type of alcohol, duration of use were not considered in the study. The elderly who were found to have dementia on HMMSE or EDQ were further advised for diagnostic work-up. Relationship between different variables with dementia was studied. The data collected were subjected for analysis using appropriate methods like Chi-square test and p value.

RESULTS

Table 1 Prevalence of dementia based on EDQ and HMMSE screening tools

SCREENING TOOLS	DEMENTIA (n=400)		PERCENTAGE
	Yes	No	
EDQ	45	355	11.25
HMMSE	5	395	1.25

All the 5 respondents who scored positive on HMMSE were also found to be positive on EDQ (Table 1).

Table 2 Relationship between dementia and certain variables

Variables	Dementia		Total	p-value
	No (%)	Yes (%)		
	n=355 n=45			
AGE GROUP				
60-74	329(92.67)	8(17.77)	337(84.25)	p=0.000
75-84	23(6.47)	32(71.1)	55(13.75)	
>85	3(.86)	5(11.1)	8(2)	
SEX				
Female	181(50.99)	33(73.33)	214(53.5)	p=.005
Male	174(49.01)	12(26.67)	186(46.5)	
LIVING STATUS				
Living alone	10(2.82)	1(2.22)	11(2.75)	p=0.268
With Spouse	33(9.29)	1(2.22)	34(8.5)	
Spouse & Children	228(64.23)	28(62.22)	256(64)	
With Children	84(23.67)	15(33.33)	99(24.8)	

EDUCATION				
Illiterate	70(19.72)	14(31.11)	84 (21)	p=0.032
Primary	49(13.80)	10(22.22)	59(14.75)	
Middle School	28(7.89)	7(15.56)	35(8.75)	
High School	90(25.35)	4(8.89)	94(23.5)	
Higher Secondary	53(14.93)	6(13.33)	59(14.75)	
Graduate	48(13.52)	3(6.67)	51(12.75)	
Professional	17(4.79)	1(2.22)	18(4.5)	
SOCIO ECONOMIC STATUS				
Upper	8(2.25)		8(2)	p=.0000
Upper Middle	11(3.09)	13(28.89)	24(6)	
Lower Middle	131(36.90)	8((17.78)	139(34.75)	
Upper Lower	181(50.98)	24(53.33)	205(51.25)	
Lower	24(6.76)	-	24(6)	
FINANCIAL STATUS				
Independent	278(78.3)	35(77.7)	313(78.25)	p=0.935
Dependent	77(21.7)	10(22.3)	87(21.75)	
TOBACCO USE				
No	236 (66.47)	23(51.11)	259(64.75)	p=0.042
Yes	119(33.52)	22(48.89)	141(35.25)	
Use of Alcohol				
Non User	268(75.49)	37(82.22)	305(76.25)	p=0.318
Ever User	87(24.51)	8(17.77)	95(23.75)	
Type of diet				
Non-Veg	352(99.15)	34(75.55)	386(96.5)	p=0.0000
Vegetarian	3(0.85)	11(24.44)	14(3.5)	
SOCIAL & RECREATIONAL ENGAGEMENT				
Inadequate	231(65.07)	15(33.33)	246(61.5)	p=0.000
Adequate	124(34.92)	30(66.66)	154(38.5)	

Table 3 Relationship between frequency of alcohol use and dementia

Frequency(n=95)	DEMENTIA		p-value
	NO(%)	YES(%)	
Daily	22(25.28)	0	P=0.021
e”3 times a week	38(43.67)	2(25)	
Weekly	12(13.79)	1(12.5)	
Occasionally	15(17.24)	5(62.5)	
Total	87(100)	8(100)	

Analysis on frequency of alcohol use was found to be statistically significant associated with dementia ($P=0.021$) (**Table 3**).

DISCUSSION

There is wide variation in prevalence of cognitive decline as well as risk factors from region to region.¹⁴ This variation may possibly be related to adoption of different methodology, screening instruments, defining criteria, multi-ethnicity, multicultural and environmental factors². The prevalence of dementia on EDQ in the present study was somewhat higher than those reported in other studies.^{15,16,17,18,19} The prevalence of dementia was found to be 2.4% and 3.6% among urban elderly population in India.^{15,18} Studies conducted to see rural-urban comparison in prevalence of dementia in India revealed a lower prevalence in urban area (2.7%) than rural areas (3.5%).^{20,21} The higher prevalence of dementia on EDQ in the present study could be attributed to the fact that EDQ concentrates on recognizing very early symptoms of dementia. Moreover, as information was also taken from the informant, there is less probability of missing early cases. In a study done by Zurrani and his colleagues, prevalence of dementia on EDQ was found to be quite high i.e. 52.3% compared to MMSE (15.5%).¹² Age and gender was two key predictors of dementia identified by various authors. The findings of significant relationship of dementia with age, education, socio-economic status were consistent with other studies.^{16,22,23} However no significant association was found between age, gender and education with EDQ screened dementia in another study.¹² An inverse association between educational level and the risk of AD or dementia has also been reported.²⁴ In the present study, although no statistically significant association was found between financial status and dementia but the relationship between financial status with dementia is well understood as there is more chance of social interaction and autonomy among the elders in the financially independent group which is indirectly protective against dementia. Living status was not significantly associated with dementia in the present study which is in contrast with other studies.²⁵ Smoking as a risk factor has been strongly documented in various studies^{26,27} which is also observed in the present study. It was noted in the present study that although use of alcohol was not significantly associated with dementia, But frequency of drinking was found to have significant association ($p=0.021$). Various studies carried out globally noted that light to moderate drinking was associated with significantly lower risk of dementia.^{28,29} Smoking and use of alcohol are the lifestyle behaviours that keep changing, so studying their effect as risk factor could be possible only in prospective type of study design. Moreover, the limitation in quantification of the substances in terms amount, duration could be attributed to this non-significant relationship. The finding of significant association between type of diet and dementia is in conformity with other studies.^{30,31} Social disengagement has been recognised as a risk factor for cognitive impairment among elderly population.^{32,33} Significant association of social and recreational engagement with

dementia in the present study indicates the need for family and social support in tangible term to make elderly active in their day to day life.

Inability to measure the variables in depth and small sample size were some limitations of the study.

Conclusion: The present study has looked into this unseen problem and highlighted the gravity of the issue. The high prevalence can be an eye opener for further research. The different correlates of the issues need to be addressed effectively.

Conflict of interest: None.

Ethical clearance: Taken from Institutional Ethical Committee.

Author's contribution: We declare that authors named in this article contributed in this study and any liabilities pertaining to the content of this article will be borne by the authors. The contributions were made as: Dr. Anku Moni Saikia: Concept, design, data collection, manuscript writing; Dr. Neelakshi Mahanta: Concept, data collection, manuscript writing; Dr. Ajaya Mahanta: Concept, design; Dr. Himamoni Deka: data collection, manuscript writing and Dr. Beeva Boruah: manuscript writing.

REFERENCES

1. Ferri CP, Prince M, Brayne C, Brodaty H, Fratiglioni L, Ganguli M et al. Global prevalence of dementia: A Delphi consensus study. *Lancet* 2005;366:2112-17.
2. Das SK, Pal S, Ghosal MK. Dementia: Indian scenario. *Neurology India* 2012;60:618-24.
3. Lepeleire JD, Heyman J, Buntinx F. The early diagnosis of dementia: triggers, early signs and luxating events. *Fam Pract* 1998;15:431-6.
4. Santacruz KS, Swagerty D. **Early diagnosis of dementia.** *Am Fam Physician* 2001;63:703-13.
5. Holzer C, Warshaw G. **Clues to early alzheimer dementia in the outpatient setting.** *Arch Fam Med* 2000;9:1066-70.
6. Brodaty H, Clarke J, Ganguli M, Grek A, Jorm AF, Khachaturian Z et al. Screening for cognitive impairment in general practice: toward a consensus. *Alzheimer Dis Assoc Disord* 1998;12: 1-13.
7. Folstein MF, Folstein SE, McHugh PR. Mini Mental State: A practical method for grading the cognitive state of patients for the clinicians. *J Psychiatr Res* 1975;12:189-98.
8. Fratiglioni L, Jorm AF, Grut M, Viitanen M, Holmen K, Ahlbom A et al. Predicting dementia from the Mini-Mental State Examination in an elderly population: the role of education. *J Clin Epidemiol* 1993;46:281-7.
9. Freidl W, Schmidt R, Stronegger WJ, Irmeler A, Reinhart B, Koch M. Mini mental state examination: influence of sociodemographic, environmental and behavioral factors and vascular risk factors. *J Clin Epidemiol* 1996;49:73-8.
10. Ganguli M, Ratcliff G, Chandra V, Sharma S, Gilby J, Pandav R et al. A Hindi version of MMSE: The development of a cognitive screening instrument for a largely illiterate rural elderly population in India. *Int J of Geriatr Psychiatry* 1995;10:367-77.
11. O'Bryant SE, Humphreys JD, Smith GE, Ivnik RJ, Graff-Radford NR, Petersen RC et al. Detecting Dementia with the Mini-Mental State Examination (MMSE) in Highly Educated Individuals. *Arch Neurol* 2008;65:963-7.
12. Zurrain A, Aziz NA, Aziz AFA, Razali R, Puteh SEW. Early Dementia Questionnaire (EDQ): A new screening instrument for early dementia in primary care practice. *BMC Family Practice* 2013;14:49.
13. Lwanga SK, Lemeshow S. Sample Size Determination in Health Studies. A Practical Manual. WHO; 1991:9.
14. Sosa AL, Albanese E, Stephan BC, Dewey M, Acosta D, Ferri CP, et al. Prevalence, distribution, and impact of mild cognitive impairment in Latin America, China, and India: A 10/66 population-based study. *PLoS Med*. 2012;9:e1001170.
15. Vas CJ, Pinto C, Panikker D, Noronha S, Deshpande N, Kulkarni L, Sachdeva S. Prevalence of dementia in an urban Indian population. *Int psychogeriatr* 2001;13:439-50.
16. Saldanha D, Mani MR, Srivastav K, Goyal S, Bhattacharya D. An epidemiological study of dementia under the aegis of mental health program, Maharashtra, Pune chapter. *Indian J psychiatry* 2010;52:131-9.
17. Raina SK, Rajdan S, Pandita KK. Prevalence of dementia in ethnic Dogra population of Jammu District, North India: A comparison survey. *Neurology Asia* 2010;15:65-9.
18. Shaji S, Bose S, Vargese A. Prevalence of dementia in an urban population in Kerala, India. *Br J Psychiatry* 2005;186:136-40.
19. Shaji S, Promodu K, Abraham T, Roy KJ, Varghese A. An epidemiological study of dementia in a rural community in Kerala, India. *Br J Psychiatry* 1996;168:745-9.
20. Rajkumar S, Kumar S. Prevalence of dementia in the community: A rural-urban comparison from Madras, India. *Australian Journal on Aging* 1996;15:57-61.
21. Rajkumar S, Kumar S, Thara R. Prevalence of dementia in a rural setting: A report from India. *Int J Geriatr Psychiatry* 1997;12:702-7.
22. Poddar K, Kant S, Singh A, Singh TB. An epidemiological study of dementia among the habitant of Eastern Uttar Pradesh, India. *Ann Indian Acad Neurol* 2011;54:164-8.
23. Gambhir IS, Khurana V, Kishore D, Sinha AK, Mohapatra SC. A clinic-epidemiological study of cognitive function status of community-dwelling elderly. *Indian J of Psychiatry* 2014;56:365-70.
24. Ott A, Bretelera MMB, Harskamp FV, Claus JJ, Cammen TJV, Grobbee DE et al. Prevalence of Alzheimer's disease and vascular dementia: association with education. The Rotterdam study. *BMJ* 1995;310: 970-3.
25. Tripathi M, Vibha D, Gupta P, Bhatia R, Srivastava MV, Vivekanandhan S et al. Risk factors of dementia in North India: a case-control study. *Aging Ment Health* 2012;16:228-35.
26. Anstey KJ, Van Sanden C, Salim A, O'Kearney R. Smoking as a risk factor for dementia and cognitive decline: A meta-analysis of prospective studies. *Am J Epidemiol* 2007;166:367-78.
27. Ott A, Slioter AJC, Hofman A, Harskamp FV, Witteman JCM, Broekhoven CV et al. Smoking and risk of dementia and Alzheimer's disease in a population-based cohort study: the Rotterdam Study. *The Lancet* 1998;351:1840-43.
28. Ruitenberg A, Swieten JCV, Witteman JCM, Mehta KM, Duijn CMV, Hofman A et al. Alcohol consumption and risk of dementia: the Rotterdam Study. *The Lancet* 2002;359:281-6.
29. Luchsinger JA, Tang MX, Siddiqui M, Shea S. Alcohol intake and risk of dementia. *J Am Geriatr Soc* 2004;52:540-6.
30. Lourida I, Soni M, Thompson-Coon J, Purandare N, Lang I A, Ukoumunne OC et al. Mediterranean Diet, Cognitive Function, and Dementia: A Systematic Review. *Epidemiology* 2013;24:479-89.
31. Luchsinger JA, Noble JM, Scarmeas N. Diet and Alzheimer's disease. *Curr Neurol Rep* 2007;7:366-72.
32. Bassuk SS, Glass TA, Berkman LF. Social disengagement and incident cognitive decline in community-dwelling elderly persons. *Ann Intern Med* 1999;131:165-73.
33. Wang HX, Karp A, Winblad B, Fratiglioni L. Late-life Engagement in Social & Leisure Activities Is Associated with a Decreased Risk of Dementia : A Longitudinal Study from the Kungshotmen project. *Am J. Epidemiol* 2002;155:1081-7.

ORIGINAL PAPER

Prevalence of risk factors of coronary heart disease amongst MBBS students of Gauhati Medical College

Saikia AK¹, Rajendran Vinoth²

Received on April 12, 2018; editorial approval on June 14, 2018

ABSTRACT

Background: In India, CHD has been increasing over the couple of years. Early identification and intervention can prevent the occurrence of CHD in later life. MBBS students representing the late adolescence may be more prone to risk factors of CHD due to their stressful lifestyle. **Objectives:** To study the prevalence of risk factors associated with CHD along with its Socio-demographic correlates. **Methods:** A cross-sectional, institution-based study was conducted among MBBS students of GMC, Guwahati, Assam from 1st Feb 2018 to 30th March 2018. A total of 400 students were taken for this purpose. The data were collected using predesigned and pretested schedule. Both interview and observation techniques were used for collecting information. DASS 21 questionnaire was used for assessing stress, depression and anxiety. The data were analyzed and association was tested using Chi-square test. **Result:** Anxiety and depression were seen in 71.75% and 62% respectively. The physical activity was inadequate. Physical activity was significantly associated with gender, residence and socio-economic status. Use of alcohol was associated with gender, and residence. Smoking was associated with age, gender, residence and socio-economic scale. **Conclusion:** This study on MBBS students clearly revealed the high prevalence of risk factors of CHD.

Keywords: CHD, DASS scale, physical activity, risk factors.

INTRODUCTION

Coronary Heart Diseases (CHD) are epidemic in south Asian countries. Over the past two decades, burgeoning mortality rate in India was observed in the prevalence of CHD. In India, from CHD, increasing trends in years of life lost (YLLs) and disability-adjusted life years (DALYs) are also highlighted by the World Health Organization (WHO) and Global Burden of Disease Study.¹ diabetes, hypertension, smoking, abdominal obesity, psychosocial stress, unhealthy diet, and physical inactivity are also reported to be an important risk factors

for CHD in India by various case-control studies.^{1,2} However, no previous studies examined the prevalence of risk factors of Coronary Heart Disease (CHD) among MBBS students of Gauhati Medical College (GMC), Guwahati, Assam. MBBS curriculum being a vast and hectic one, in spite of the knowledge about the CHD, many students acquires some of the risk factors of CHD. Early interventions are crucial for the prevention of CHD in later part of life.

So the present study has been conducted among the MBBS students with the following objectives: (1) To study the prevalence of risk factors associated with CHD and (2) To study the relationship of different risk factors with socio-demographic correlates.

METHODS

A cross-sectional, institution-based study was conducted among MBBS students of GMC, Guwahati from 1st Feb 2018 to 30th March 2018. Informed consent was obtained from all the participants. Due to non-availability of sufficient data on prevalence of risk factors in young adults, sample size was calculated considering $p = 0.5$.³ Taking allowable error as 10%, the sample size was calculated as 400 by applying the formula of $4PQ/L^2$. From each semester, equal number of students (44) who were willing to participate in the study was included. Only in the last semester 48 students were included to meet the required sample size. The attendance register for each semester was considered as sampling frame

Address for correspondence:

¹Professor

Email: drankumonisaikia@rediffmail.com

Mobile: +919435016507

²PGT 2nd year (**Corresponding Author**)

Mobile: +919597459322

Email: rvinoth351@gmail.com

Dept of Community Medicine

Gauhati Medical College and Hospital, Guwahati

Cite this article as: Saikia AM, Rajendran Vinoth. Prevalence of risk factors of coronary heart disease amongst MBBS students of Gauhati Medical College. *Int J Health Res Medico Leg Prae* 2018 July;4(2):35-39. DOI 10.31741/ijhrmlp.v4.i2.2018.9

and the students were selected randomly by lottery method. Known or diagnosed cases of heart disease were excluded, in this case the next roll number has been included. Body Mass Index (BMI) as per WHO Guidelines was used for assessing obesity.^{4,5,6} Further, physical activity was measured using International Physical Activity Questionnaire (IPAQ).^{7,8} Alcohol intake was measured using Alcohol Use Disorders Identification Test (*AUDIT*) questionnaire.^{9,10} Classification

Table 1 Prevalence of risk factors of CHD

RISK FACTORS	TOTAL (N=400)	
	No.	%
SMOKERS		
NEVER SMOKERS	348	87
FORMER SMOKERS	14	3.5
CURRENT SMOKERS	38	9.5
ALCOHOL INTAKE		
LOW	360	90
MEDIUM	24	6
HIGH	12	3
ADDICTION	4	1
PHYSICAL ACTIVITY		
LOW	94	23.5
MODERATE	196	49
HIGH	110	27.5
BMI		
UNDERWEIGHT	36	9
NORMAL	288	72
OBESITY	10	2.5

OVERWEIGHT	66	16.5
DIET		
NON-VEG	376	94
VEG	24	6
EXTRASALT INTAKE		
NO	328	82
YES	72	18
STRESS		
ABSENT	219	54.75
PRESENT	181	45.25
ANXIETY		
ABSENT	113	28.25
PRESENT	287	71.75
DEPRESSION		
ABSENT	152	38
PRESENT	248	62

of smoking status was done as per Centers for Disease Control and Prevention (CDC) guidelines.^{11,12} To see the relationship between smoking, BMI, alcohol and physical activity with socio-demographic correlates only current smokers, BMI>25, low alcohol users and low physical activity has been considered. Operational definitions were made for classifying individuals based on type of diet. Those who have been taking vegetarian diet for the last 6 months were considered vegetarian and vice versa. DASS 21 was used for measuring stress, anxiety and depression. To measure symptoms of depression, anxiety and stress in both clinical and non-clinical samples of adults, DASS-21 is a well-established instrument.^{13,14,15} A predesigned and pretested schedule was used to collect the information. Association

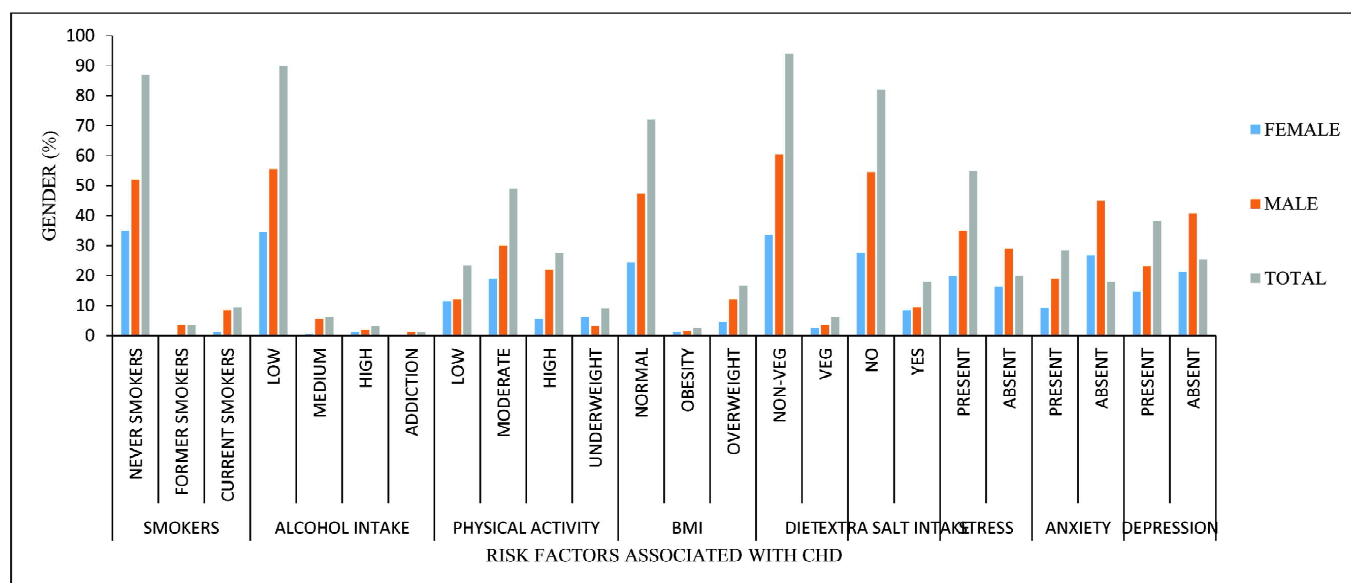


Figure 1 Prevalence and association of risk factors associated with gender

between different variables of risk factors of CHD with socio-demographic was studied. The data were analyzed by using excel, instatgraphpad and SPSS version 25 software. All comparisons were considered significant at $p < 0.05$. Informed consent was taken from each participant. Permission from the Institutional ethics committee was obtained.

Table 2 Association of lifestyle related risk factors with socio-demographic correlates

SOCIO- DEMOGRAPHIC CORRELATES	PHYSICAL ACTIVITY		Chi- square	ALCOHOLIC	NON- ALCOHOLIC	Chi- square	SMOKER	NON- SMOKER	Chi- square
	INADEQUATE n=94	ADEQUATE n=306		n=40	n=360		n=38	n=362	
	No.(%)	No.(%)	p-value	No.(%)	No.(%)	p-value	No.(%)	No.(%)	p-value
AGE									
19-20 YEARS	22(5.5)	88(22)	0.9005	14(3.5)	96(24)	0.862	12(3)	98(24.5)	0.0371*
21-22 YEARS	68(17)	186(46.5)		20(5)	234(58.5)		14(3.5)	240(60)	
23-24 YEARS	4(1)	32(8)		6(1.5)	30(7.5)		12(3)	24(6)	
GENDER									
MALE	48(12)	208(52)	0.003*	6(1.5)	138(34.5)	0.004*	4(1)	140(35)	0.001*
FEMALE	46(11.5)	98(24.5)		34(8.5)	222(55.5)		34(8.5)	222(55.5)	
RELIGION									
CHRISTIAN	6(1.5)	24(6)	0.003	4(1)	26(6.5)	0.794	4(1)	26(6.5)	0.554
HINDU	68(17)	212(53)		28(7)	252(63)		26(6.5)	254(63.5)	
MUSLIM	16(4)	60(15)		6(1.5)	70(17.5)		8(2)	68(17)	
OTHERS	4(1)	10(2.5)		2(0.5)	12(3)		-	14(3.5)	
RESIDENCE									
HOME	34(8.5)	98(24.5)	0.017*	2(0.5)	130(32.5)	0.000*	4(1)	128(32)	0.001*
HOSTEL	50(12.5)	128(32)		26(6.5)	152(38)		26(6.5)	152(38)	
OTHERS	4(1)	30(7.5)		8(2)	26(6.5)		6(1.5)	28(7)	
PAYING GUEST	6(1.5)	50(12.5)		4(1)	52(13)		2(0.5)	54(13.5)	
MODIFIED KUPPUSAMY SCALE									
LOWER MIDDLE	4(1)	24(6)	0.012*	6(1.5)	22(5.5)	0.139	6(1.5)	22(5.5)	0.023*
UPPER LOWER	-	6(1.5)		-	6(1.5)		2(0.5)	4(1)	
UPPER MIDDLE	60(15)	222(55.5)		28(7)	254(63.5)		22(5.5)	260(65)	
UPPER	30(7.5)	54(13.5)		6(1.5)	78(19.5)		8(2)	76(19)	

Table 3 Association of stress, anxiety and depression with socio-demographic correlates and other risk factors of CHD

VARIABLES	STRESS		Chi-square	ANXIETY		Chi-square	DEPRESSION		Chi-square
	PRESENT	ABSENT		PRESENT	ABSENT		PRESENT	ABSENT	
	No.(%)	No.(%)	P-value	No.(%)	No.(%)	P-value	No.(%)	No.(%)	P-value
AGE (YEARS)									
19-20	53(13.5)	57(14.25)	0.578	80(20)	30(7.5)	0.958	74(18.5)	36(9)	0.111
21-22	110(27.5)	144(36)		181(45.25)	73(18.25)		148(37)	106(26.5)	
23-24	18(4.5)	18(4.5)		26(6.5)	10(2.5)		26(6.5)	10(2.5)	
GENDER									
MALE	142(35.5)	114(28.5)	0.7	76(19)	180(45)	0.395	98(24.5)	158(39.5)	0.877
FEMALE	77(19.25)	67(16.75)		37(9.25)	107(26.75)		54(13.5)	90(22.5)	
RESIDENCE									
HOME	59(14.75)	73(18.25)	0.272	89(22.25)	43(10.75)	0.354	76(19)	56(14)	0.010*
HOSTEL	81(20.25)	97(24.25)		130(32.5)	48(12)		107(26.75)	71(17.75)	
OTHERS	20(5)	14(3.5)		28(7)	6(1.5)		30(7.5)	4(1)	
PAYING GUEST	21(5.25)	35(8.75)		40(10)	16(4)		35(8.75)	21(5.25)	
SMOKING									
NON-SMOKER	160(40)	202(50.5)	0.192	256(64)	106(26.5)	0.157	219(54.75)	143(35.75)	0.056
SMOKER	21(5.25)	17(4.25)		31(7.75)	7(1.75)		29(7.25)	9(2.25)	
ALCOHOL INTAKE									
ALCOHOLIC	20(5)	20(5)	0.525	27(6.75)	13(3.25)	0.529	30(7.5)	10(2.5)	0.074
NON-ALCOHOLIC	161(40.25)	199(49.75)		260(65)	100(25)		218(54.5)	142(35.5)	

PHYSICAL ACTIVITY									
INADEQUATE	41(10.25)	53(13.25)	0.716	70(17.5)	24(6)	0.503	49(12.25)	45(11.25)	0.024*
ADEQUATE	140(35)	166(41.5)		217(54.25)	89(22.25)		199(49.75)	107(26.75)	
BMI									
BMI>25	34(8.5)	42(10.5)	0.92	54(13.5)	22(5.5)	0.881	46(11.5)	30(7.5)	0.769
BMI≤25	147(36.75)	177(44.25)		233(58.25)	91(22.75)		202(50.5)	122(30.5)	
TYPE OF DIET									
NON-VEGETARIAN	171(42.75)	205(51.25)	0.716	273(68.25)	103(25.75)	0.132	235(58.75)	141(35.25)	0.415
VEGETARIAN	10(2.5)	14(3.5)		14(3.5)	10(2.5)		13(3.25)	11(2.75)	

RESULT

Out of the total of 400 study subjects, 54% were males. Majority (63.5%) belong to the age group of 21-22 years.

Table 1 Revealed that out of the 400 students, 52(13%) was found to be smokers either former or current. Almost all the participants were found to using alcohol in different quantity. However majority (90%) were found to be low alcohol users. Majority of the overweight subjects were males.

While seeking the association between different risk factors with socio demographic variables, in table 2, a statistical significant association was seen between physical activity, alcohol and smoking with gender. Physical activity was significantly associated with residence and socio-economic scale. Alcohol was significantly associated with residence. Smoking was found to be significantly associated with age, residence and socio-economic scale.

Table 3 Revealed that there was statistically significant association between residence and physical activity with depression.

DISCUSSION

High prevalence of smoking was observed in male students which was in conformity with another study done on Asian population.¹⁶ Smoking was seen more with higher prevalence above the age of 21 years is in conformity with other report.¹² The current finding of more alcohol use among males is consistent with other studies.¹⁷

A comparatively high prevalence (23.5%) of low physical activity in the present study is in consistent with other study.¹⁸ A significant association of physical activity with gender, socio-economic class and residence is an important observation in which there is great scope for intervention. The significant relationship between place of residence and physical activity could be attributed to the fact that those who reside in hostel may have less physical activity compared to those who reside in home. Though high prevalence of physical inactivity seen in this study, it is found to be comparatively lower than Pinto BM *et al.* study. Low physical activity has been identified as major risk factor for overweight and obesity.^{19,20}

It was found that approximately one-fifth of the study population had a BMI >25 kg/m² (19%), in which males were comparatively higher than females. It may be due to

lesser time spend in outdoor games, sports and inappropriate diet intake. The prevalence of overweight and obesity in this study was found to be slightly less than the prevalence found in the study Huang TT *et al.*²¹ Lower prevalence of obesity in the present study may be due to the study population (Medical students). An immediate intervention which include health promotional activities is crucial among the medical students. Provision of outdoor or games facilities and encouragement for the same is necessary.

High prevalence of stress, anxiety and depression among the study population could be due to the hectic schedule of medical school. The stress, anxiety and depression has been found to be major risk factor for CHD.^{22,23,24} The finding of high prevalence of stress and anxiety were also reported among medical students in Vaidya *et al.* But the prevalence of depression was found to be higher in our study which was in contrast to Vaidya *et al.* study.²² It clearly indicates that depression were found to be increasing in the MBBS students which may be due to change in the lifestyle and less time spent in the physical activities.

Limitation: All the risk factors associated with CHD were not considered for the study. Due to lack of resources the biochemical parameters were not taken into account for this study.

CONCLUSION

The prevalence of risk factors associated with CHD were found to be high in study population. Considering high prevalence of stress, anxiety and depression, a thorough and indepth evaluation along with some interventions for improving the issues in mental health is the need of the hour. However a qualitative research will answer many potential factors for such a high prevalence among group who are supposed to know the risk factors. This is crucial in regard early identification and intervention to prevent occurrence of CHD in the later life.

Conflict of interest: None.

Ethical clearance: Obtained.

Source of funding: Nil.

Acknowledgements: We would like to thank Dr. Radhika Rajendran, Dr. Khagorika Saikia, Dr. Azhanuo Khezhe, Dr. Sabrina Yasmin, Dr. Rakesh Sharma, Dr. Mintu Dewri Bharali, Dr. Basanta Biraj Das, Dr. Rohit Kumar Sinha, Dr. Saras Sanchaya.

REFERENCE

- Gupta R, Mohan I, Narula J. Trends in coronary heart disease epidemiology in India. *Annals of global health* 2016 Mar 1;82(2):307-15.
- Prabhakaran D, Jeemon P, Roy A. Cardiovascular diseases in India: current epidemiology and future directions. *Circulation* 2016 Apr 19;133(16):1605-20.
- Sarmukaddam SB, Garad SG. On validity of assumption while determining sample size. *Indian Journal of Community Med* 2004;29:87-91.
- Kuczmarski MF, Kuczmarski RJ, Najjar M. Effects of age on validity of self-reported height, weight, and body mass index: findings from the Third National Health and Nutrition Examination Survey, 1988–1994. *Journal of the American Dietetic Association* 2001 Jan 1;101(1):28-34.
- Romero-Corral A, Somers VK, Sierra-Johnson J, Thomas RJ, Collazo-Clavell ML, Korinek J, Allison TG, Batsis JA, Sert-Kuniyoshi FH, Lopez-Jimenez F. Accuracy of body mass index in diagnosing obesity in the adult general population. *International journal of obesity* 2008 Jun;32(6):959.
- Deurenberg P, Weststrate JA, Seidell JC. Body mass index as a measure of body fatness: age-and sex-specific prediction formulas. *British journal of nutrition* 1991 Mar;65(2):105-14.
- Craig CL, Marshall AL, Sjoerstrom M, Bauman AE, Booth ML, Ainsworth BE, Pratt M, Ekelund UL, Yngve A, Sallis JF, Oja P. International physical activity questionnaire: 12-country reliability and validity. *Medicine and science in sports and exercise* 2003 Aug 1;35(8):1381-95.
- Hagströmer M, Oja P, Sjöström M. The International Physical Activity Questionnaire (IPAQ): a study of concurrent and construct validity. *Public health nutrition* 2006 Sep;9(6):755-62.
- Fleming MF, Barry KL, Macdonald R. The alcohol use disorders identification test (AUDIT) in a college sample. *International Journal of the Addictions* 1991 Jan 1;26(11):1173-85.
- Schmidt A, Barry KL, Fleming MF. Detection of problem drinkers: the alcohol use disorders identification test (AUDIT). *Southern Medical Journal* 1995 Jan 1;88(1):52-9.
- Wetter DW, Young TB, Bidwell TR, Badr MS, Palta M. Smoking as a risk factor for sleep-disordered breathing. *Archives of internal medicine* 1994 Oct 10;154(19):2219-24.
- Centers for Disease Control and Prevention (CDC). Current cigarette smoking prevalence among working adults—United States, 2004-2010. *MMWR. Morbidity and mortality weekly report* 2011 Sep 30;60(38):1305.
- Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological assessment* 1998 Jun;10(2):176.
- Sinclair SJ, Siefert CJ, Slavin-Mulford JM, Stein MB, Renna M, Blais MA. Psychometric evaluation and normative data for the depression, anxiety, and stress scales-21 (DASS-21) in a nonclinical sample of US adults. *Evaluation & the Health Professions* 2012 Sep;35(3):259-79.
- Henry JD, Crawford JR. The short form version of the Depression Anxiety Stress Scales (DASS 21): Construct validity and normative data in a large non clinical sample. *British journal of clinical psychology* 2005 Jun 1;44(2):227-39.
- Epstein JA, Botvin GJ, Diaz T. Ethnic and gender differences in smoking prevalence among a longitudinal sample of inner-city adolescents. *Journal of adolescent health* 1998 Sep 1;23(3):160-6.
- Wilsnack RW, Vogeltanz ND, Wilsnack SC, Harris TR. Gender differences in alcohol consumption and adverse drinking consequences: cross cultural patterns. *Addiction* 2000 Feb 1;95(2):251-65.
- Kriska AM, Saremi A, Hanson RL, Bennett PH, Kobes S, Williams DE, Knowler WC. Physical activity, obesity, and the incidence of type 2 diabetes in a high-risk population. *American journal of epidemiology* 2003 Oct 1;158(7):669-75.
- Pinto BM, Marcus BH. A stages of change approach to understanding college students' physical activity. *Journal of American College Health*. 1995 Jul 1;44(1):27-31.
- Trost SG, Kerr LM, Ward DS, Pate RR. Physical activity and determinants of physical activity in obese and non-obese children. *International journal of obesity* 2001 Jun;25(6):822.
- Huang TT, Harris KJ, Lee RE, Nazir N, Born W, Kaur H. Assessing overweight, obesity, diet, and physical activity in college students. *Journal of American College Health* 2003 Sep 1;52(2):83-6.
- Vaidya PM, Mulgaonkar KP. Prevalence of depression anxiety & stress in undergraduate medical students & its co relation with their academic performance. *Indian Journal of Occupational Therapy* 2007 Apr 1;39(1).
- Hemingway H, Marmot M. Clinical Evidence: Psychosocial factors in the etiology and prognosis of coronary heart disease: systematic review of prospective cohort studies. *Western Journal of Medicine* 1999 Nov;171(5-6):342.
- Suls J, Bunde J. Anger, anxiety, and depression as risk factors for cardiovascular disease: the problems and implications of overlapping affective dispositions. *Psychological bulletin* 2005 Mar;131(2):260.

ORIGINAL PAPER

Impact of adverse drug reactions on quality of life in patients with schizophrenia

Chakravarty Pinaki¹, Neog Parthajyoti², Roy Dolly³

Received on April 05, 2018; editorial approval on May, 01, 2018

ABSTRACT

Objective: To monitor the adverse drug reactions of antipsychotic drugs used in patients with schizophrenia in the outpatient department of psychiatry & to find out the impact of adverse drug reactions on quality of life in those patients. **Methodology:** A prospective observational study was carried out in the outpatient department of psychiatry. New patients with schizophrenia and above 18 years of either sex with only one antipsychotic drug were included. ADRs reported spontaneously by the patients and also responses obtained in a questionnaire related to the likely ADRs from the patients were recorded in the case record form. QOL was assessed with the help of World Health Organization Quality of Life-BREF questionnaire method and scoring system at the beginning and after 1 month. **Results:** The incidence of ADR was 64.78% in males and 35.21% in females. Weight gain was the most common ADR observed. The psychological health is mostly affected by ADRs. A low QOL was noted in all patients with ADRs. **Conclusion:** Atypical antipsychotics are frequently used to treat schizophrenia. It is due to their better patient compliance and high margin of safety compared to typical antipsychotics.

Keywords: Outpatient, Antipsychotics, WHOQOL-BREF.

INTRODUCTION

Schizophrenia is one of the most common psychiatric disorder belongs to the diseases of the central nervous system and characterized by disturbances in emotion, cognition, motivation, and socialization. Due to their high prevalence, early onset and persistence they contribute substantially to the burden of illness worldwide. The diagnosis of schizophrenia continues to be made solely from clinical observations using criteria in the diagnostic and statistical manual of mental disorders of the American Psychiatric Association (2000), 4th edition, text revision (DSM-IVTR).¹ Schizophrenia is characterized by impairment in the perception

or expression of reality, leading to occupational and social dysfunction.² Schizophrenia affects general health, functioning, autonomy, subjective well-being, and life satisfaction of those patients who suffer from it. It is one of the top causes of disability in the world even after the pharmacological and psychosocial intervention for almost 50 years.³

In recent years there has been a broadening in focus in the measurement of health beyond traditional health indicators such as mortality and morbidity. Now a days Quality of Life (QOL) has turned into an important outcome in clinical and interventional studies.⁴ The WHO defines Quality of Life (QOL) as 'an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns.'⁵ In order to evaluate the true impact of treatment benefit, it is important to quantify not only the impact of the disease on health-related quality of life but also the impact of treatment-related adverse events.

There are many published quality of life (QOL) measures but there is still a lack of consensus among researchers about its definition and this is reflected in the choice of items for their instruments. Therefore, in determining QOL, the WHOQOL group takes the view that it is important to know how satisfied or worried people are by vital aspects of their life, and this interpretation will be a highly individual matter. The World Health Organization Quality of Life assessment,

Address for correspondence:

¹Associate Professor (**Corresponding Author**)

Coordinator of ADR monitoring Centre

Email: pinakichakravarty@gmail.com

Mobile: +917002704747

²PGT, ³Associate Professor

Department of Pharmacology

Silchar Medical College & Hospital, Assam

Cite this article as: Chakravarty Pinaki, Neog Parthajyoti, Roy Dolly. Impact of adverse drug reactions on quality of life in patients with schizophrenia. *Int J Health Res Medico Leg Prae* 2018 July;4(2):40-44. DOI 10.31741/ijhrmlp.v4.i2.2018.10

the WHOQOL-100 is a cross-culturally valid assessment of well-being. Assessment is operationalized through 100 items representing 25 facets organized in six domains.^{10,11} Based on these results, the WHOQOL-BREF was developed in the context of four domains of QOL: physical, psychological, social and environmental.¹²

Objectives: 1. To detect the adverse drug reactions of antipsychotic drugs in patients with schizophrenia at the outpatient department of psychiatry. 2. To assess the quality of life in those patients.

METHODOLOGY

It is a prospective observational study in the psychiatry outpatient department of Silchar Medical College and Hospital, Silchar for a period of 1 year from April'2015 to March' 2016. The patients who are newly diagnosed with schizophrenia are included and data are recorded in a pre-designed case record form, after taking the consent from the patient/attendant of the patient. Clearance from the institutional ethical committee was taken.

Quality of life was assessed with the help of World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire method and scoring system at the beginning and after 1 month.

Inclusion Criteria

1. Patients diagnosed with schizophrenia between 18-50 years age group of either sex.
2. Patients with normal blood haemogram, normal blood sugar level, normal lipid profile and normal ECG.

Exclusion criteria

1. Pregnant and lactating woman
2. Patients with severe psychosis and violent behavior.
3. Patients who have already taken any other antipsychotic or antidepressant medication.
4. Patients with renal or hepatic impairment.
5. Patients with a history of alcohol or substance abuse.
6. Patient unable or not willing to give consent.

WHOQOL-BREF scoring system

A quality of life profile can be created by WHOQOL-BREF (Field Trial Version). It produces four domain scores, and in each score, denote an individual's perception of quality of life in each domain (higher scores denote higher quality of life). Scores are noted in a positive direction and mean score is calculated out from each item in each domain. To make it comparable with the scores used in the WHOQOL-100 (original complete version), each mean score from each domain is to be multiplied by 4 (four) and the mean score is converted to a domain score. Two items that are examined separately are: question 1 asks about an individual's overall perception of quality of life and question 2 asks about an individual's overall perception of their health. The first transformation method converts scores to range between 4-20, comparable with the WHOQOL-100. The second

transformation method converts domain scores to a 0-100 scale.¹³

RESULTS

A total of 82 patients were enrolled and the quality of life was assessed to each and every patient with the help of WHOQOL-BREF questionnaire and scoring system. Patients who were showing or complaining at least one adverse drug reaction after one month with antipsychotic treatment were included in the study and enlisted them for evaluating QOL. Consequently, 11 patients with schizophrenia who were not showing any adverse drug reactions with antipsychotic therapy were evaluated separately. 71 patients have shown different types of ADRs with antipsychotic therapy, out of which 46(64.78%) were male and 25(35.21%) were female and prescribed atypical antipsychotic medications were olanzapine 54(76.05%), risperidone 8(11.26%), amisulpride 7(9.85%) and quetiapine 2 (3%) respectively. Olanzapine 76.05% (54 patients) and risperidone 11.26%(8 patients) were the most repeatedly prescribed antipsychotic drugs. Amisulpride was used in 9.85%(7) patients and quetiapine to 2.81% (2) patients.

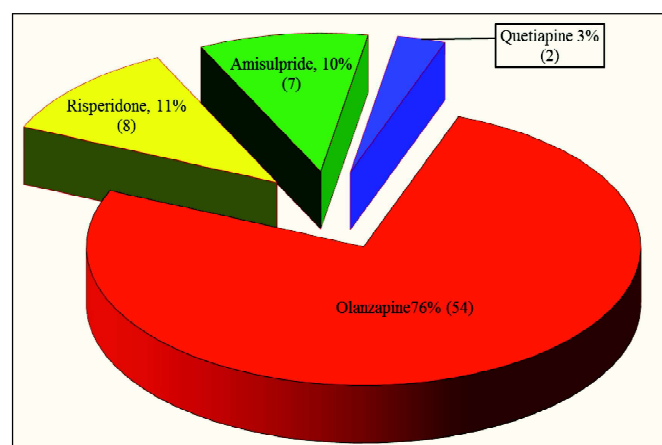


Figure 1 Antipsychotic drugs causing adverse drug reactions

Weight gain, GI upset, insomnia, sedation, aggressive behavior, and anxiety accounted for nearly 64% of all adverse drug reactions. Mild to moderate ADRs included a headache, tremor, concentration difficulty, fatigue, anemia, dizziness, constipation, restlessness, EPS, asthenia, and were treated by changing the dose and/or relevant medications to treat the symptoms. A total of 166 times ADRs were noted in those 71 patients. Weight gain was seen in 38(53.52%) patients, the gastrointestinal upset was seen in 22(30.98%) patients, insomnia and sedation were seen in 19(26.76%) and 11(15.49%) patients respectively, likewise aggressive behavior and anxiety were seen in 8(11.26%) patients.

As per WHOQOL-BREF questionnaire and scoring method, the overall QOL has improved due to the antipsychotic therapy in all the patients. At the beginning or before the start of the therapy the overall average QOL score was 31.25 (0-100 scale) and it has increased up to 75 after 1 month of the antipsychotic therapy. In every domain of assessment of the

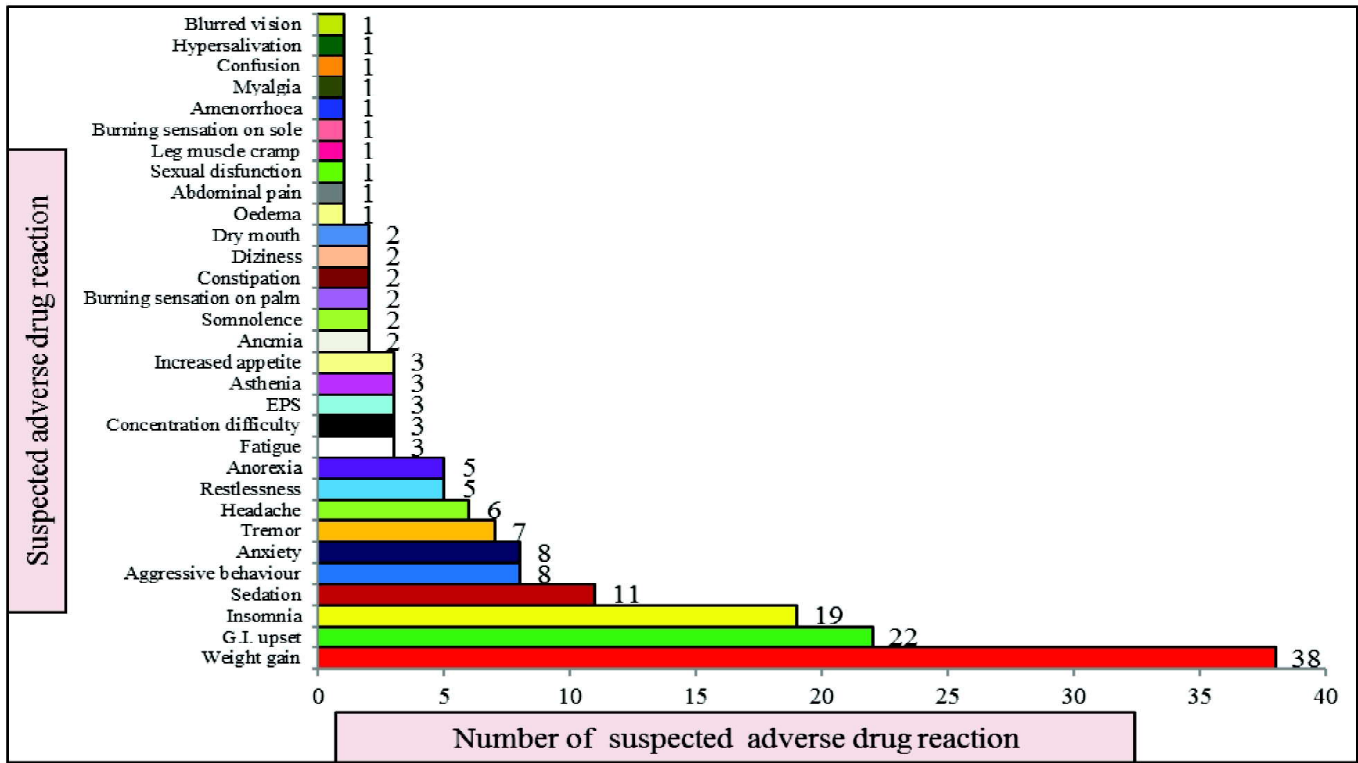


Figure 2 Spectrum of suspected ADRs noted among 71 patients

quality of life, score increase was remarkable. The maximum health-related quality of life has increased in physical health and psychological health category. Comparatively less increase was seen in social health and environmental health category.

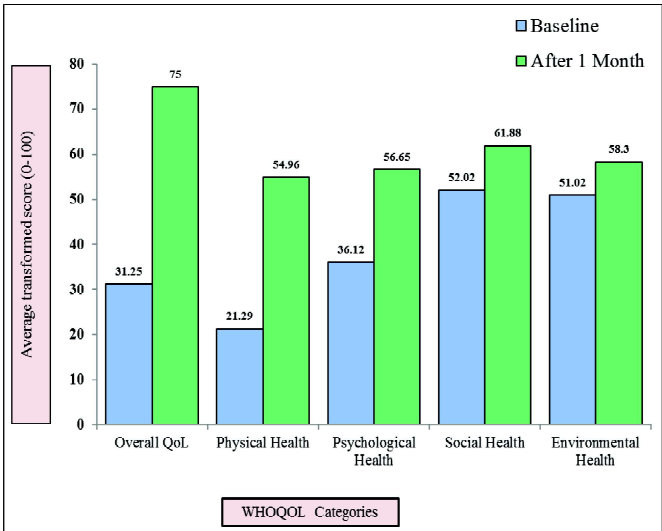


Figure 3 Category wise WHO Quality of Life-BREF scores

A baseline score was recorded for each and every patient who was diagnosed as a case of schizophrenia. Scores after 1 month were different for patients who were showing different types of ADRs and for patients who were not showing any signs and symptoms of ADRs. Baseline values for both groups of patients were almost same. The WHOQOL-BREF transformed score was always higher in

schizophrenic patients without any ADRs after 1 month of antipsychotic therapy. The score was 59.41 (0-100 scale) in the physical health category, 69.69 in the psychological health category, 63.63 in social health category and 66.75(0-100 scale) in the environmental health category. Sharp decreases in scores were seen in patients with schizophrenia with ADRs. The scores were 54.27(0-100 scale) in physical, 54.63 (0-100 scale) in psychological, 61.61 in social and 56.99 in the environmental health category.

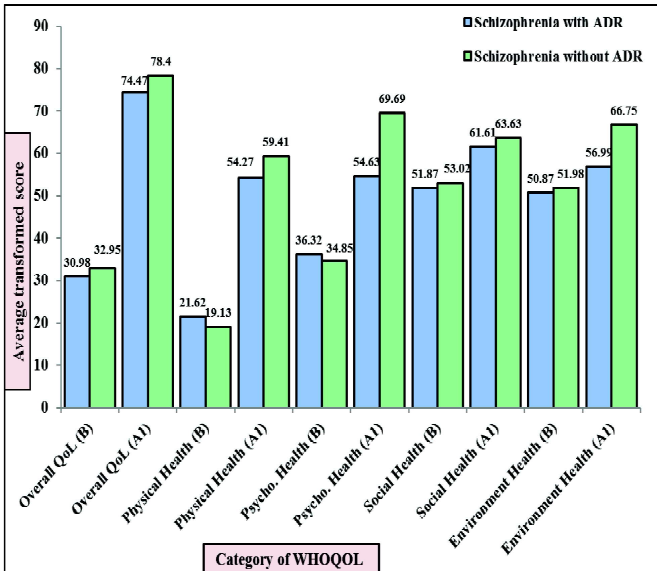


Figure 4 Category wise WHOQOL scores at baseline (B) and after 1 month (A1) in patients with ADR and without ADR

DISCUSSION

Out of all ADRs, 72.28% reactions are recorded in patients treated with olanzapine followed by 16.86% events in risperidone. 11(13.41%) patients who were not showing any signs of ADR having a higher quality of life compared to 71(86.58%) patients who were showing different kinds of ADR. EPS has the maximum detrimental effect on QOL compared to other ADRs.

A study conducted in Kolkata reported that atypical antipsychotics were responsible for 57.1% of ADRs. Tremors (19.6%), weight gain (15.34%) and constipation (14.49%) were the most common adverse reactions. Olanzapine (31.82%) followed by haloperidol (19.03%) were the most common drugs responsible for ADRs.¹⁴

Another study done in Gujarat reported 93 ADRs from 84 prescriptions. Maximum ADRs were due to risperidone and olanzapine. Common ADRs encountered were weight gain, dizziness, and sleep and appetite disturbances.¹⁵

The present study determined the effect of ADRs on the various aspects of health using quality of life scale and as expected, the quality of life of patients with schizophrenic disorders with adverse drug reactions was lower than in the patients with schizophrenic disorders without adverse drug reactions. The results support the conclusions of previous studies, showing the lower health-related quality of life in schizophrenic patients with ADRs compared to the schizophrenic patients without ADRs.^{16,17}

In the psychological health category, patients with schizophrenia with ADRs scores were significantly lower than in the patients with schizophrenia without ADRs. It is not surprising that psychological well-being of the mentally ill patients was lower than in healthy subjects since this domain includes questions related to satisfaction towards life, meaningfulness, enjoyment, concentration and negative feelings and these areas might be fully affected by their illness. The results of the present study support the findings of a study done by Chawla *et al.*¹⁶ where patients with bipolar disorder had significantly higher scores than a schizophrenia group in the psychological domain.

In physical health category also scores of patients with schizophrenia with ADRs were significantly lower than in the patients with schizophrenia without ADRs. This domain includes physical pain, need of medical treatment for bodily function, energy to work, sleep, daily living activities, moving around and capacity for work.

In the environmental health domain, patients with schizophrenia with ADRs again has a lower score and this implies a disadvantage with respect to physical safety and security, financial resources, health and social care and their availability, opportunities for acquiring new information and skills and participation in recreational activities and transport. This may be due to lack of rehabilitation program or may be due to excessive financial dependency on their families.

Social health domain includes the personal relationship, sexual

health, and support from friends. Antipsychotic therapy has a positive impact on this category and significantly improves the quality of life but with an ADR has an equally negative effect and degrades the quality of life score more down.

Psychiatric patients with ADRs reported less satisfaction in all domains of WHOQOL compared to patients without ADRs. In a study done by Akvardar *et al.*¹⁸ indicates that patients with schizophrenia obtained the lowest scores on all domains except in physical domain confirming the third hypothesis. Schizophrenia is a chronic disorder that results in a significant social, psychological, and occupational dysfunction.

Measurement of quality of life is equally important when treating patients with any chronic conditions that significantly impair their life, as in schizophrenia.¹⁹ Every aspect of daily life is affected by schizophrenia, including what activities they can perform, where they live and work and how they interact with other people. Therefore, social integration, work, social contacts and a sense of belonging in the community must be the therapeutic goal to improve their subjective quality of life.

The benefit of conducting quality of life surveys lies in providing these patients with an opportunity to express what is working and what is not in their lives. From the clinical viewpoint, this study implies that, in general, treatment programs should encourage patients and staff to work jointly to identify strategies for promoting the patient's quality of life.

Schizophrenia causes enormous socioeconomic burden, consequently, it causes remarkable low resources and services in a society.²⁰ And along with its various ADRs may complicate the condition more.

Research and clinical experience show that community-based care achieves better treatment results in mentally ill persons. Clinical trials are also an effective way to curb the mental health problems. In India and in other developing countries the combinations of pharmacotherapy and psychosocial interventions (rehearsal of independent living skills, training in social skills, vocational training, social support networks, family interventions) and still lacking and needs to be addressed as a priority.

A small sample size was the major weakness of the present study and it affects the generalizability of the results. WHOQOL-BREF is a valuable generic instrument. It provides useful results consistent with clinical as well as theoretical knowledge. Psychiatric illness like in schizophrenic disorder is a potential target for therapeutic intervention and methods like WHOQOL-BREF are suited for assessing health-related quality of life in those areas.

CONCLUSION

The nature of adverse drug reactions was confined to mainly metabolic, reproductive, gastrointestinal, and neurological systems by the use of atypical antipsychotics in patients with schizophrenia. Presence of an adverse drug reaction sharply decreases the physical, psychological, social and

environmental aspect of health-related quality of life. The impact of an ADR on the quality of life and the total cost due to use of an expensive antipsychotic or due to ADR needs to be measured. This study recommends caution in prescribing any antipsychotic drugs which are known to have the higher incidence of adverse drug reactions in patients with schizophrenia and also promotes the awareness that psychiatric patients may contribute valuable self-reports on selected aspects of their quality of life.

Source of funding: Nil

Conflicts of interest: None declared.

Ethical clearance: Taken.

REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington DC: American Psychiatric Association; 2000.
2. Kasper DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL. Harrison's's principle of internal medicine. 16th ed. New York: McGraw-Hill; 2005. p. 2559-60.
3. Murray CL, Lopez AD. The global burden of disease. Boston: Harvard University Press; 1996.
4. Fairclough DL. Introduction in design and analysis of quality of life studies in clinical trials. New York: Chapman and Hall/CRC; 2002. p. 4-15.
5. WHOQOL Group. Development of the WHOQOL: Rationale and current status. *Int J Mental Health* 1994;23:24-56.
6. Wood-Dauphine S. Assessing quality of life in clinical research: From where have we come and where are we going? *J Clin Epidemiol* 1999;52:355-63.
7. McHorney CA. Health status assessment methods for adults: Past accomplishments and future challenges. *Ann Rev Public Health* 1999;20:309-35.
8. Muldoon MF, Barger SD, Flory JD, Manuck SB. What are quality of life measurements measuring? *Br Med J* 1998;316:542-5.
9. Guyatt GH, Naylor CD, Juniper E et al. Users' guide to the medical literature XII: How to use articles about health-related quality of life. *J Am Med Assoc* 1997;277:1232-7.
10. WHOQOL Group. The World Health Organization Quality of Life assessment (WHOQOL): Position paper from the World Health Organization. *Soc Sci Med* 1995;41:1403-9.
11. WHOQOL Group. The World Health Organization Quality of Life assessment (WHOQOL): Development and general psychometric properties. *Soc Sci Med* 1998;46:1569-85.
12. The WHOQOL group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med* 1998;28:551-8.
13. WHOQOL-BREF. Introduction, Administration, Scoring and Generic Version of The Assessment. World Health Organization 1996.
14. Sengupta G, Bhowmick S, Hazra A, Datta A, Rahaman M. Adverse drug reaction monitoring in psychiatry outpatient department of an Indian teaching hospital. *Indian J Pharmacol* 2011;43:36-9.
15. Piparva KG, Buch JG, Chandrani KV. Analysis of adverse drug reactions of atypical antipsychotic drugs in psychiatry OPD. *Indian J Psychol Med* 2011;33:153-7.
16. Chawla S, Kumar S. Adverse Drug Reactions and their Impact on Quality of Life in Patients on Antipsychotic Therapy at a Tertiary Care Center in Delhi. *Indian J Psychol Med* 2017 May-Jun;39(3):293-298.
17. Olga V. Zadorozhnaya, Vadim A. Akhmedov. Adverse Drug Reactions and Quality of Life in Schizophrenia Patients with Chronic Viral Hepatitis. *Int J Biomed* 2012;2(1):34-7.
18. Akvardar Y, Akedede B, Eser E. Assessment of quality of life with the WHOQOL-BREF in a group of Turkish psychiatric patients compared with diabetic and healthy subjects. *Psychiatry and Clinical Neurosciences* 2006;60:693-99.
19. Iptekin K, Akvardar Y, Akdede KÝvýrcýk BB *et al.* Is quality of life associated with cognitive impairment in schizophrenia? *Prog. Neuropsychopharmacol. Biol. Psychiatry* 2005;29:239-244.
20. World Health Organization. The World Health Report 2001. Mental health: new understanding, new hope. World Health Organization; 2001.

ORIGINAL PAPER

Assessment of childrearing practices among tribal and nontribal women

Borah Kobita¹, Talukdar Kunjalal², Deka RS³, Bhuyan Hemeswari⁴

Received on January 03, 2018; editorial approval on June 03, 2018

ABSTRACT

Background: Child rearing practices are diverse for different communities and vital for well-being of the infants. In fact, it largely affects the life outcome of the babies. **Aim:** To assess the childrearing practices among tribal and non-tribal women in Kamrup (Rural) district, Assam, by employing a descriptive comparative study. **Method:** Multistage Stratified Random Sampling technique was used to select 100 tribal and 100 non-tribal women who have 6 months old baby. Semi-structured interview schedule was used to collect information. **Result:** All the tribal women (rf=1) and majority of non-tribal women (rf=.95) fed colostrums to their baby as the first feed. Majority from the both group (tribal rf=.815, non-tribal rf=.775) had initiated breast feeding within 2 hours following delivery. Most of the women-tribal and non-tribal, fed breast milk on demand, while the fraction of tribal women (rf=.75) who continued exclusive breast feeding for 6 month is more than non-tribal (rf=.37) women. Both the groups were found not be concerned about age specific play material, and few used cotton based soft clothing. Majority (tribal rf=.55, nontribal rf=.47) had given baby bath within 10 days following delivery with warm water. Tribal women relied more on home remedies for common minor ailments of their babies. **Conclusion:** Maximum aspects of child rearing practices of both groups were basically influenced by their family beliefs and practices. Health care providers are most influencing factor for complete immunization as expressed by all the women.

Keywords: Complementary feeding, minor ailments, home remedies.

INTRODUCTION

Child rearing practices are major determinants of morbidity status of infants.¹ Cultural factors and taboos have a powerful influence on feeding practices and eating patterns. Inadequate nutrition knowledge and adherence to cultural practices lead

to poor quality feeding practices.² The present study was primarily designed to assess the practices on childrearing from birth to one year among tribal and nontribal women in Kamrup (Rural) district of Assam. Our study ascertains some key factors influencing the trend of child rearing in the study area.

METHODS

Study design and area: We employed survey approach and retrospective descriptive method to meet the objectives of our study.

Study population and sampling: We considered all tribal and non-tribal women belonging to the Kamrup (Rural) district of Assam who have six months old baby as sample. We selected 4 Blocks (30%) from 13 Development Block in the Kamrup (Rural) District applying simple random sampling technique. The list of the sub centers was considered as sampling frame. From each Block PHC, two sub-center were selected, one each from tribal and non-tribal dominated area (total 8 sub centers from 4 Blocks). From each sub-center 25 women are selected by using lottery method, giving a sample size of: $25 \times 8 = 200$. Data were collected in two observations. In first observation data were collected about

Address for correspondence:

¹Lecturer, Dept. of Obstetrics & Gynaecological Nursing, B.Sc. Nursing College Dibrugarh, Assam 786001

Email: kobitaborah@yahoo.in

²Principal cum Professor, Dept. of Anatomy, MGM Medical College, Kishanganj, Bihar

³Associate Professor (**Corresponding Author**), Dept. of Anatomy, Guwahati Medical College, Guwahati 781032

E mail: rupsekhar@yahoo.com

Mobile: +91 9435196276

⁴Associate Professor, Community Health Nursing, Regional College of Nursing, Guwahati, Assam

Cite this article as: Borah Kobita, Talukdar Kunjalal, Deka RS, Bhuyan Hemeswari. Assessment of childrearing practices among tribal and nontribal women. *Int J Health Res Medico Leg Prae* 2018 July;4(2):45-49. DOI 10.31741/ijhrmlp.v4.i2.2018.11

the child rearing practices upto six months of age, and second observations were made after six months from the first observation. In both observation data were collected by retrospective approach.

Data collection tools and techniques: We developed two tools for our study: i) semi-structured interview schedule, for background information of the sample women, ii) semi structured interview schedule to collect information regarding; Part A: child rearing practices from birth to six month, and Part B: child rearing practices from seven months to one year.

RESULTS

Demographic profile: Majority of the surveyed women (non-tribal $rf=.90$ and tribal $rf=.77$) were between 20 to 35 years. Bulk of those women (non-tribal $rf=.87$ and tribal $rf=.837$) had either secondary or below secondary education. Most of the women were housewife (tribal $rf=.885$, non-tribal $rf=.93$). Majority of the sample population -nontribal ($rf=.47$) and tribal ($rf=.49$) had per capita per month income of less than Rs 974.00. We found that maximum tribal women ($rf=.785$) were living in joint families in comparison to non-tribal women, where most of the women ($rf=.53$) belonged to nuclear family. Majority of the women from nontribal ($rf=.505$) were married for 3-5 year and tribal ($rf=.335$) were married for ≥ 2 years. Commonly both group (tribal $rf=.65$, nontribal $rf=.495$) had one living child. Primary health care services available for the both group is sub center and mode of transportation is usually walk. All the women from both group had institutional delivery and majority of them i.e. non-tribal ($rf=.745$) and tribal ($rf=.805$) had normal per vaginal delivery.

Child rearing practices

Breast feeding: We found that no one had given prelacteal feeding to their babies. **Table 1** present the data related to nature of breast feeding practices of non-tribal and tribal women.

Table 1 Relative frequency distribution of the according to the nature of breast feeding (N=200)

Sl. No.	Sample criteria	Relative frequency (rf)	
		Tribal (N1=100)	Nontribal (N2=100)
2	Reasons of giving breast feeding		
	-Because of hospital delivery	0	.03
	-advised given by health care provider	.785	.635
	-advised by family members/friends	.125	.115
	-influenced by information provided by media.	.09	.085
3	Interval of giving breast feeding		
	-On crying/ demand feeding	.55	.54
	-One hour interval	.32	.35
	-Two hour interval	.13	.095
	-on crying and 1 hour interval	0	0.015

4	Duration of Exclusive breast feeding		
	-1 month	0	0.09
	-4 months	.01	.07
	-6 months	0.02	0.26
	-7 months	0.75	0.37
	-> 7 months	0.22	0.21

Early initiation of breast feeding was done by a few surveyed women (non-tribal $rf=.42$, tribal $rf=.41$). A small number of women had fulfilled the recommended duration of exclusive breast feeding from both the group. Further investigation suggests few reasons for not providing exclusive breast feeding upto six months of age as stated by the women of both group (**Table 2**).

Table 2 Relative frequency distribution of the women against reasons of not providing exclusive breastfeeding (N=200)

Sl. No.	Sample criteria	Relative frequency (rf)	
		Tribal (N1=100)	Nontribal (N2=100)
1	Reasons of not providing breast feeding up to six months of age		
	-Insufficient breast milk	.33	0.07
	-Family member	0.67	0.19
	-Personal choice	0	0.52
	-Large nipple	0	0.05
	-Health care provider advise for complementary feeding	0	0.17
2	Reasons of giving exclusive breast feeding after 7 months of age		
	-Family members/ friends	.68	.62
	-Self knowledge	.32	.381

Complementary feeding: Our study recognizes the three most commonly used types of complementary feeding among the non tribal women: tin food along with cow's milk ($rf=.27$), rice powder cooked with diluted cow's milk ($rf=.18$), cooked rice powder of boiled rice along with goats milk ($rf=.13$). Among the tribal women, more commonly used complementary food were: over cooked rice, daal and cow's milk ($rf=.15$); biscuit, cow's milk and water ($rf=.14$); rice prepared for other family member ($rf=.13$).

Feeding at the age of 7 to 9 months: **Figure 1** shows the data from our present study for different type of feeding given to babies between 7 to 9 months age.

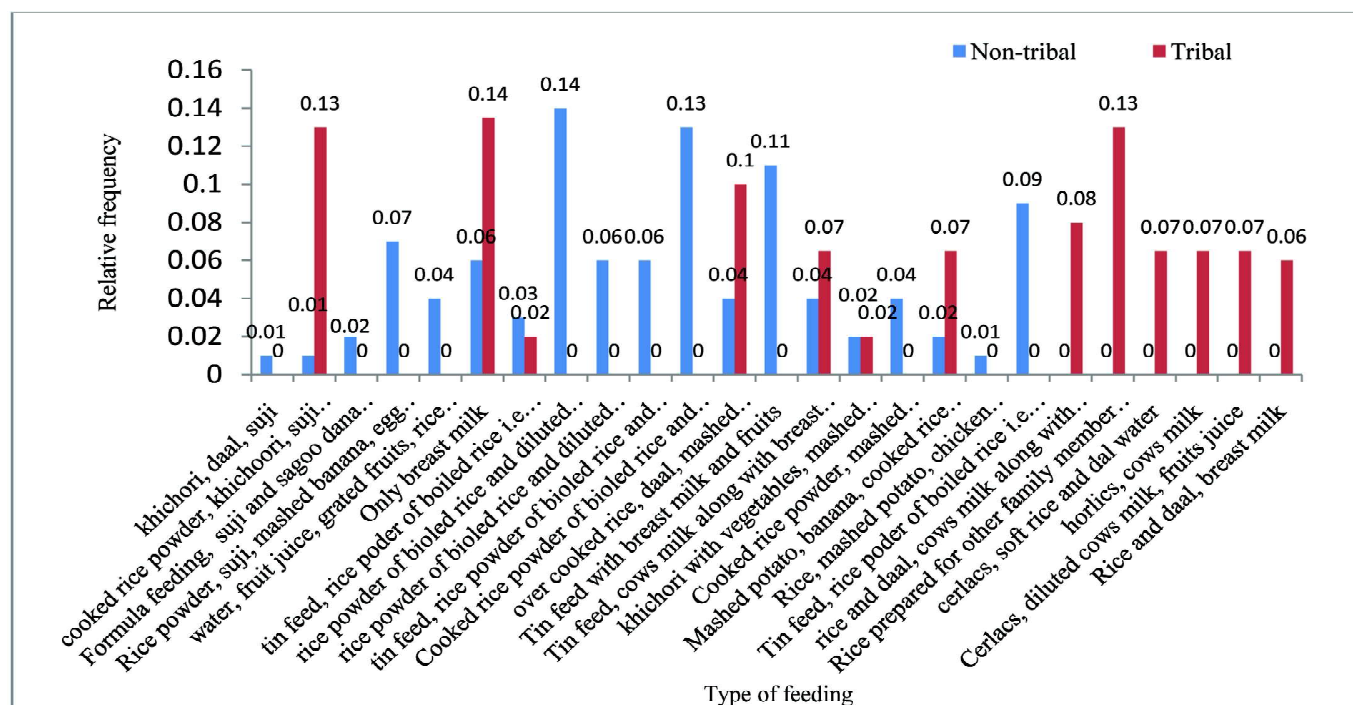


Figure 1 Relative frequency distribution for type of baby feeding between 7 to 9 months (N1=100, N2=100)

Table 3 Relative frequency distribution of the postnatal mother according to nature of child rearing practices (N=200)

Sl. No.	Nature of child rearing	Relative frequency (rf)	
		Tribal (N1=100)	Nontribal (N2=100)
1	Type of play material provided		
	-Light, soft, easy to handle	0.02	0.1
	-Toys with high contrasts and simple design	0.44	0.57
2	Type of play activity allowed for the baby		
	-nothing special	0.65	0.75
	-let the baby play with siblings with supervision	0.03	0.04
3	Type of baby clothing provided		
	-Soft and cotton based	0.07	0.21
	-Any soft material	0.6	0.29
4	Time of giving first baby bath		
	-< 10 days	0.55	0.47
	-10-15 days	0.32	0.38
5	Type of water used for baby bath		
	-Warm water in all season	0.79	0.51
	-Warm water in winter season and cold in summer	0.02	0.22
	-Water that is warmed under sunlight	0.19	0.27

Feeding at 9 months to one year: We found that few women from tribal group had not started complementary feeding upto one year of age. Most common feeding among tribal women were rice prepared for other family members (rf=.17), boiled rice and daal, cows milk (rf=.13) and khichori, suji prepared with cows milk (rf=.08). Among the non tribal women khichori suji, cows milk (rf=.1), rice powder of boiled rice prepared with cows milk, suji, mashed cooked vegetables, fruits (.09) and over cooked rice with daal (.08) were most commonly seen.

Immunization and other aspect: Immunization is one of the most important aspects of healthy child rearing practices. We found that all the women from both groups had covered the immunization up to the age as per government schedule. Our study identified the involvement of the health care provider as the key factor of determining complete coverage of immunization. **Table 3** summarizes some other important aspect of childrearing practices investigated in our study.

Common minor ailments and remedies used: We have investigated about the type of the common minor ailments of the babies of tribal and non tribal women. We found cold and cough (non tribal rf=.51, tribal rf=.91) and vomiting (non tribal rf=.40, tribal rf=.66) were most widespread minor ailments. The common minor ailments among the babies of the non-tribal women and the usual remedies prescribed to the babies are given in **Table 4**.

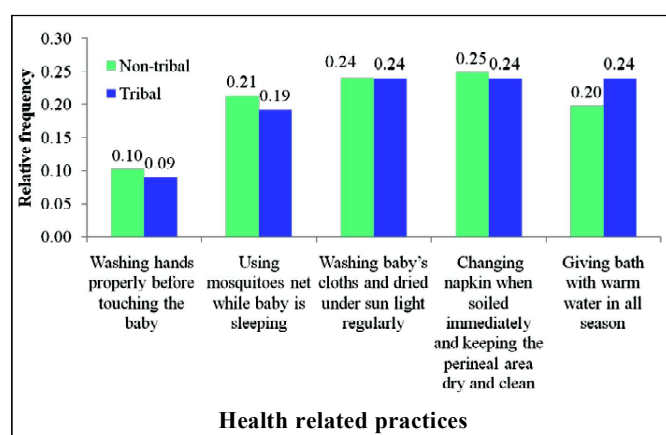
Among the babies of the tribal women cold and cough and vomiting were the most frequently occurred minor ailments (f= 91, f= 66 respectively). For vomiting, half (f=33) of the surveyed tribal women had went for doctor's advice and

Table 4 Frequency and percentage distribution of the non-tribal women according to nature of common health problem of their baby and remedies used (N1 = 100)

Health problems	n1	Nature of remedies									
		Doctor's advice		Home remedies		No remedies		Religious practices		Quack	
		f	%	f	%	f	%	f	%	f	%
Vomiting	40	30	75	1	2.5	9	22.5	0	0	0	0
Cold & cough	51	4	7.8	47	92.2	0	0	0	0	0	0
Skin rash	24	3	12.5	0	0	15	62.5	6	25	0	0
Eye infection	3	2	67	0	0	1	33	0	0	0	0
Feeding problem	4	1	25	0	0	0	0	0	0	3	75
Diarrhoea	24	24	100	0	0	0	0	0	0	0	0

others used home remedies. Conversely, majority of the tribal women (f=85) used home remedies for cold and cough. Few babies of the tribal women (f=27) had skin rashes and majority (54%) of them used religious practices for the treatment of skin rashes. Our study reveals that babies of few tribal women had eye infection (27) and almost 78% of them had applied breast milk instillation to the infected eyes as the mode of treatment. Some other minor ailments seen among the babies of the tribal women were feeding problem (6) and diarrhoea (19).

Health related practices: Our study identifies some health related hygienic practices among non-tribal and tribal women (**Figure 3**) in connection with taking care of their babies.

**Figure 2** Relative frequency distribution of tribal and non-tribal women for health related practices (N1=100, N2=100)

DISCUSSION

Healthy rearing practices ensure better health of the infants, and also reflect the positive cultural practices of the community. Our present study found that all the surveyed women had institutional delivery. Prelacteal feeding was not given by any of the surveyed women. However, practices of prelacteal feeding is reported to be significant among the

women who had home deliveries.^{1,5,10,11,12,13} This may be one of the positive outcomes of institutional delivery.

Notwithstanding all the women in the present study had institutional deliveries, only 41% tribal and 42% non-tribal women breastfed their babies within one hour of birth. Alternatively, a study in Karnataka found that though the home delivery rate among the surveyed women were 34 %, the early initiation of breast feeding was done by 34.5% women.¹ In West Bengal also it was observed that instead of 83.6% women had home deliveries, 42.4% had initiated breast feeding within one hour.¹² In Bangalore 34.2 % deliveries took place at home but 98.6% of them had initiated breast feeding within the first hour of birth.⁶ This suggest that health institutions were not always ensuring the early initiation of breast feeding to their babies, at least in the study area of the present study. This is one of the important concerns that need to be addressed by the hospital authority.

The World Health Organization recommends exclusive breastfeeding for the first 6 months of life with early initiation and continuation of breastfeeding for 2 years or more together with adequate and appropriate complementary feeding starting at 6 months in developing country³. We found that only few women from both group (tribal rf=.02 and nontribal rf=.26) had given exclusive breast feeding upto 6 months of age which is lower than the observations made in other studies.^{4,5,6,7} Involvement of other family members in breastfeeding awareness programme may improve the presenting scenario of exclusive breastfeeding.

The benefits of breastfeeding depend on quality of exclusivity and recommended duration. Our paper reflects the dilution of quality of exclusive breastfeeding in two aspects in terms of duration among both tribal and nontribal community. The most common reason behind providing exclusive breast feeding less than 6 month among the tribal populations (rf=0.67) were reported as the family members' decision and for non-tribal women (rf=.52) because of their own choice. Lack of awareness about the importance of duration

of exclusive breast feeding may be the main influencing factor. This is positively supported by another study carried out in Rural Tamilnadu which reports that with increasing literacy status, the fraction of women who had given pre-lacteal feeding decreases notably (Chi-square for trend $\chi^2 = 21.5$; $P < 0.001$).⁹ However, in costal India family influences was reported as the most leading factor, for example mothers belonging to joint family breast fed the child for more than a year compared to those belonging to nuclear families (64.5% v/s 35.5% and $p < 0.05$).⁵

The most positive aspect found in the present study is complete coverage of immunization as per the government schedule. The reason behind this was reported as the influence of health care provider (i.e. tribal $rf = .8$ and nontribal $rf = .74$). In Rural Tamil Nadu it was found that women who had three children, 15 out of 39 (38%) had fully immunized their first child as compared with 25 out of 39 (64%) for the second child and 38 out of 39 (97%) for the third child.⁵ This suggests a trend where birth order may have a positive correlation with increase in awareness.

CONCLUSION

We found that child rearing practices, in essence, are influenced by the cultural beliefs among both tribal and nontribal women. Duration of exclusive breast feeding upto six months of age along with type of complementary feeding need to be more emphasized by the health care personnel. This study found that both the communities utilized traditional home remedies for treatment of common minor ailments, for example cold and cough. Among the tribal women common home remedies used for eye infection is breast milk instillation to the affected eyes of the babies.

Conflict of interest: None.

Ethical clearance: Taken from Institutional Ethical Committee.

Author's contribution: We declare that authors named in this article contributed in this study and any liabilities pertaining to the content of this article will be borne by the authors.

REFERENCES

1. Joseph N, Unnikrishnan B, Naik VA, Mahantshetti NS, Mallapur MD, Kotian SM, Nelliyanil M. Infant rearing practices in south India: A longitudinal study. *J Fam Med Primary Care* 2013;2(1):37-43.
2. Kruger R, Gericke GJ. A qualitative exploration of rural feeding and weaning practices, knowledge and attitudes on nutrition. *Public Health Nutrition* 2003;6(1):217-223.
3. World Health Organization. Global strategy for infant and young child feeding. Geneva:World Health Organization 2003;p.41.
4. Cacodcar J, Dubhashi A, Joglekar SA. Cross-Sectional Study on Child Rearing Practices in Rural Goa. *Journal of Krishna Institute of Medical Science* 2015;4(4):64-73.
5. Kumar N, Unnikrishnan B, Rekha T, Mithra P. *Infant feeding and rearing practices adapted by mothers in Coastal South India. Int J Collaborative Res on Internal Med&PublicHealth* 2012;7(1):14-6.
6. Nisha C, Sugna A, Surekha A, Sulekha T. Infant and child feeding among tribal population in Bangalore district, Karnataka. *National J of Research in Community Med* 2015;4(4):370-373.
7. Sreegiri S, Nayak MSDP, Naidu A, Madhavi BD. Feeding practices and nutritional status of tribal children under 5 years of age in ITDA Paderu Division, Visakhapatnam. *IOSR J of Dental and Med Sci* 2015;14(6):10-14.
8. Das P, Ghosh S, Ghosh M, Mandal A. A study on delivery and newborn care practices in a rural block of West Bengal. *Indian J Public Health* 2008;52:159-60.
9. Srivastava SP, Sharma VK, Kumar V. Breast feeding pattern in neonates. *Indian Pediatr* 1994;31:1079-82.
10. Bhosale NA, Deshpande SG, Zodpey SP, Jog SN, Vasudeo ND. Infant feeding practices in urban population-a clinic based study. *Indian J Med Science* 1997;51:396-9.
11. Bandyopadhyay SK, Chaudhury N, Mukhopadhyaya BB. Breast feeding practices in rural areas of West Bengal. *Indian J Public Health* 2000;44:137-8.
12. Goswami M, Dash B, Dash N. C. Maternal care and childrearing practices: A micro level study among the Bhumija tribe of Northern Orissa, India. *South Asian Anthropologist* 2012,12(1):51-59.

ORIGINAL PAPER

Predictors of falls and falls-related injury in elderly with mild cognitive impairment

Saikia AM¹, Das AK², Goswami Kumaril³

Received date on Nov 15, 2018; editorial approval on January 03, 2018

ABSTRACT

Introduction: Falls and Mild Cognitive Impairment(MCI) are two important causes of disability in the elderly. There is tremendous impact on falls in elderly with MCI. Falls and falls related injuries make elderly more prone to frailty. Time Up and Go test is a tool for identifying risk of falls in this group. However there is paucity of information regarding falls in cognitively impaired elderly. **Objectives:** 1. To assess the risk of falls. 2. To find out the different predictors of falls in elders with MCI. 3. To assess different fall related injuries. **Materials and Methods:** A cross sectional community based study, was conducted in 10 randomly selected wards of Guwahati City. A total of 400 elders were studied. MCI was screened by Montreal Cognitive Assessment Scale, Timed Up and Go test was performed to assess the risk of falls. History of fall was obtained by asking questions on falls in last 12 months. **Results:** Overall falls prevalence was 19.5% whereas among MCI cases it was 39.74% fall in MCI was significantly associated with Gender and Timed Up and Go Test. Timed Up and Go Test is significantly associated with MCI among fallers. Chance of falls related injury is less in elders without MCI. Fracture was more in elders with MCI. **Conclusion:** Falls in elderly with MCI is significant issue which needs to be addressed in a holistic way. TUG can be used to assess the risk of falls in elderly with Mild Cognitive impairment.

Keywords: Falls, Cognitive Impairment, Time Go Test, Predictors, elderly

INTRODUCTION

With increasing life expectancy, there is tremendous increase of morbidities and disabilities in old age. Falls and cognitive impairment are two important causes of morbidity and disability. A fall is defined here as an event which results in a person coming to a rest inadvertently on the ground or floor or other lower level.¹ Mild cognitive impairment (MCI) has been identified as a transition phase between normal cognitive

ageing and early dementia.²

Fall itself is a significant cause of injuries, loss of confidence, increased morbidity, institutionalization and mortality in all older people.^{3,4} Falls account for over 80% of injury-related admissions to hospital of people older than 65 years.^{5,6} Senile Dementia is an important risk factor for serious falls, and falls are associated with loss of independence in demented patients.⁷ Older adults with MCI were noted to have poorer Timed Up and Go (TUG) Test performance⁸ and cognitive impairment was identified as an independent determinant of TUG score.⁹ Co-existence of two geriatric giants makes elders more vulnerable to frailty. However, there is paucity of information especially in Indian context regarding falls in elderly with MCI. So, the present study has been conducted to assess predictors of fall and falls related injuries amongst elderly with Mild Cognitive Impairment (MCI).

MATERIALS AND METHODS

A cross-sectional, community-based study was conducted among elderly aged 60 years and above, from June to August 2015. Informed consent was obtained from the participants as well as from the caregiver/family members. Critically ill elderly, elderly with known/diagnosed neuropsychiatric, psychiatric or musculoskeletal diseases, severe dementia (on Mini Mental State Examination score less than 15), were excluded from this study. Elders who were found to score >5 on 15 Geriatric Depression Scale (15 GDS) were also excluded. Considering the paucity of data on prevalence

Address for correspondence:

¹Professor, Community Medicine
Gauhati Medical College

²Associate Professor (Corresponding Author)

Mobile: 9864030150

Email: dr.ashokkrdas@rediffmail.com

Department of surgery, FAA Medical College, Barpeta

³Demonstrator, Community Medicine, Gauhati Medical College

Cite this article as: Saikia AM, Das AK, Goswami Kumaril. Predictors of falls and falls-related injury in elderly with mild cognitive impairment. *Int J Health Res Medico Leg Prae* 2018 July;4(2):50-52. DOI 10.31741/ijhrmlp.v4.i2.2018.12

of falls, sample size was calculated considering $p=0.5$.¹⁰. Taking allowable error as 10%, the sample size was 400 applying the formula of $4PQ/L^2$. MCI was screened by The Montreal Cognitive Assessment (MoCA), a brief screening tool for MCI has a sensitivity of 90% for detecting MCI¹¹. Timed Up and Go (TUG) Test was performed to assess the risk of falls. From the 31 wards of Guwahati City, 10 wards were selected randomly and from each ward, 40 elderly will be selected. House to house visits were made and data were collected in a predesigned and pretested schedule. History of fall was obtained based on previous falls in last 12 months. TUG Test was performed to assess the risk of falls.¹²History of chronic disease (more than 6 months) were asked. For inadequate vision, operational definition was made. Perceived difficulty in doing day to day activities due to poor vision has been considered as inadequate vision.

Table 1 Distribution of falls in relation to cognitive status

Impaired cognitive status	Falls					
	Yes (%)	%	No (%)	%	Total	%
Yes	31 (39.7)	68.89	14 (4.35)	31.11	45	100
No	47 (60.3)	13.23	308 (95.7)	86.76	355	100
Total	78 (100)		322 (100)		400	

$P<0.05$, $df=1$, chi square value=75.285

Table 2 showed the results of TUG test. Majority (66.67%) elders with MCI had showed impaired TUG test. A significant relationship was seen between MCI and TUG in elders with history of falls.

Table 2 Relationship of TUG results with MCI

MCI	TUG				Total	
	Normal	%	Impaired	%	No.	%
Yes	15 (6.61)	33.33	30 (17.34)	66.67	45	100
No	212 (93.39)	59.72	143 (82.66)	40.28	355	100
	227 (100)		173 (100)		400	

$P<0.05$, $df=1$, chi square value=10.278

In Table 3 in assessing the relationship of different variables of falls with MCI, gender and TUG were found to be significantly associated with MCI.

Relationship between different variables of falls with MCI was studied. The data were subjected for analysis using appropriate methods like Chi-square test and p value.

RESULTS

Table 1 revealed the distribution of falls among community dwelling elderly in reference to cognitive status, out of 400 elderly interviewed, 45 (11.25%) were found to have MCI on Montreal Cognitive Assessment scale. As a whole, falls prevalence was 19.5% (78/400). Occurrence of falls was

reported in majority of elderly with MCI (68.89%). A statistically significant relationship ($p<0.05$) was observed between falls and MCI.

Table 3 Relationship of predictors of fall with Mild Cognitive Impairment

Predictors	Mild Cognitive Impairment				Total (n=78)	P value
	Ycs (n=31)	%	No (n=47)	%		
Age					No %	>0.05
60-74	6 (19.35)	37.5	10 (21.24)	62.5	16 100	
75-84	23 (74.19)	41.82	32 (68.08)	58.18	55 100	
>85	2 (6.45)	28.57	5 (10.64)	71.43	7 100	
Gender						<0.05
Male	22 (70.96)	59.46	15 (31.91)	40.54	37 100	
Female	9 (29.03)	21.95	32 (68.09)	78.05	41 100	
Comorbid conditions						>0.05
≥2	11 (35.48)	35.48	20 (42.55)	64.52	31 100	
3	8 (25.81)	40.00	12 (25.53)	60	20 100	
>3	12 (38.71)	44.44	15 (31.91)	55.56	27 100	
Vision						>0.05
Normal	7 (22.58)	30.43	16 (34.04)	69.57	23 100	
Impaired	24 (77.42)	43.64	31 (65.96)	56.36	55 100	
TUG						<0.05
Normal	9 (29.03)	18.75	39 (82.98)	81.25	48 100	
Impaired	22 (70.97)	73.33	8 (17.02)	26.67	30 100	

Table 4 states that out of 31 MCI cases, more common injuries are lacerations and sprains. Again, out of the total cases with falls, 38.30% of elderly without MCI did not encounter any injuries in comparison to elders with MCI who did not revealed any injuries (19.35%). Out of total cases who experienced falls during the last one year, 54 (69%) had history of falls related injuries. Fractures was reported more by elderly with MCI (9.68%) than elderly with normal cognition (2.13%).

Table 4 Falls related injuries and MCI

Type of injury	MCI				Total	
	Yes (n=31)	%	No (n=47)	%	(n=78)	
					No %	
No Injury	6 (19.35)	25	18 (38.30)	75	24 100	
Yes (n=54)						
Laceration	10 (32.26)	32.26	21 (44.68)	67.74	31 100	
Contusion	4 (12.90)	80	1 (2.13)	20	5 100	
Sprain / Strains on joints	8 (25.81)	57.14	6 (12.76)	42.86	14 100	
Fractures	3 (9.68)	75	1 (2.13)	25	4 100	

DISCUSSIONS

There is wide variation in the prevalence of falls as well as MCI due to different methodological approach, screening instrument, social and environmental landscapes. Balance, gait and impaired executive functions are associated with risk of falls.¹³ Studies have shown that those with MCI or mild AD had significantly reduced balance and limb

coordination compared with cognitively-intact individuals.¹⁴ Impaired physiological function, structural and functional brain abnormalities are also associated with impaired cognition, including executive functions.¹⁵ The finding of present study of significant association between falls and MCI were in conformity with other studies.^{13,16,17,18,}

Older women with MCI demonstrated greater number of falls risk factors than older women without MCI.¹⁹ This finding is in consistent with the finding of present study. The observation of non-significant association of age, number of co-morbid conditions, vision among the fallers with MCI could be attributed to small sample size. However, the significance of TUG test in elderly with MCI was found in our study which is in conformity with other studies.^{20,21,22} Although vision is an important predictor of falls²³, but in relation to MCI, a non-significant association was found.

Rate of fall-injury is seen to be somewhat lower in the present study than published literatures.²⁴ The reason behind the reported low injury may be attributed to lower executive and memory functions among the cognitively impaired group. However fall injury is more in cognitively impaired elderly which may be attributed to difficulty in coordination and impairment in executive functions in protecting oneself from injuries.

Limitation of the study is we could not go for neuro-psychological evaluation for MCI. Some radiological investigations could not be done due to resource limitations. A temporal relationship could not be established due to cross-sectional design of the study.

CONCLUSION

Risk screening for falls is crucial in elderly with MCI. TUG test can be done to assess the risk of fall and to prevent falls-related injuries. Considering the increased occurrence of serious injuries like fractures among the MCI group of elderly, it is really necessary to do fall assessment so that effective interventions could be undertaken. However further indepth studies with larger sample size is required in this regard.

Conflict of Interest: None.

Ethical clearance: Taken.

Source of funding: Nil.

Contribution of authors: We declare that this work was done by the author(s) named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

- World Health Organization. WHO global report on falls prevention in older age. Geneva: World Health Organization; 2008.
- Petersen RC. Mild cognitive impairment as a diagnostic entity. *Journal of internal medicine* 2004 Sep 1;256(3):183-94.
- Tinetti ME, Inouye SK, Gill TM, Doucette JT. Shared risk factors for falls, incontinence, and functional dependence. Unifying the approach to geriatric syndromes. *Journal of the American Medical Association* 1995;273:1348–53.
- Tinetti ME, Williams CS. Falls, injuries due to falls, and the risk of admission to a nursing home. *New England Journal of Medicine* 1997;337:1279–84.
- Kannus P, Parkkari J, Koskinen S, Niemi S, Palvanen M, Jarvinen M et al. Fall-induced injuries and deaths among older adults. *JAMA* 1999;281:1895–9.
- Kannus P, Niemi S, Parkkari J, Palvanen M, Vuori I, Jarvinen M. Hip fractures in Finland between 1970 and 1997 and prediction for the future. *Lancet* 1999;353:802–5.
- Morris JC, Rubin EH, Morris EJ, Mandel SA. Senile dementia of the Alzheimer's type: an important risk factor for serious falls. *Journal of Gerontology* 1987;42:412–17.
- Lee SH, Han JH, Jin YY, Lee IH, Hong HR, Kang HS: Poor physical fitness is independently associated with mild cognitive impairment in elderly Koreans. *Biol Sport* 2016;33: 57–62.
- Pondal M, delSer T: Normative data and determinants for the timed “up and go” test in a population-based sample of elderly individuals without gait disturbances. *J Geriatr Phys Ther* 2008;31:57–63.
- Lwanga SK, Lemeshow S. Sample Size Determination in Health Studie. A Practical Manual. WHO; 1991:9.
- Nasreddine ZS, Phillips NA, Bedirian V, Charbonneau S, Whitehead V, Collin I et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc* 2005;53:695–699.
- Podsiadlo D, Richardson S. The timed ‘Up & Go’: a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc* 1991;39:142–8.
- Rapport LJ, Hanks RA, Millis SR, Deshpande SA. Executive functioning and predictors of falls in the rehabilitation setting. *Archives of Physical Medicine and Rehabilitation* 1998;79:629–633.
- Franssen EH, Souren LE, Torossian CL, Reisberg B. Equilibrium and limb coordination in mild cognitive impairment and mild Alzheimer's disease. *J Am Geriatr Soc* 1999;47:463–469.
- De Groot JC, De Leeuw FE, Oudkerk M, Gijn JV, Hofman A, Jolles J, Breteler MM. Cerebral white matter lesions and cognitive function: the Rotterdam Scan Study. *Ann Neurol* 2000;47(2):145-51.
- Tyrovolas S, Koyanagi A, Lara E, Santini ZI, Haro JM. Mild cognitive impairment is associated with falls among older adults: Findings from the Irish Longitudinal Study on Ageing (TILDA). *Exp Gerontol* 2016;75:42-7.
- Delbaere K, Kochan NA, Close JC, Menant JC, Sturnieks DL, Brodaty H, Sachdev PS, Lord SR. Mild cognitive impairment as a predictor of falls in community-dwelling older people. *The American Journal of Geriatric Psychiatry* 2012 Oct 1;20(10):845-53.
- Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. *New England journal of medicine*. 1988 Dec 29;319(26):1701-7.
- Liu-Ambrose T, Ashe MC, Graf P, Beattie BL, Khan KM. Mild cognitive impairment increases falls risk in older community-dwelling women. *Physical therapy*. 2008 Dec;88(12):1482.
- Ibrahim A, Singh DK, Shahar S. ‘Timed Up and Go’ test: Age, gender and cognitive impairment stratified normative values of older adults. *PloS one*. 2017 Oct 3;12(10):e0185641.
- Mirelman A, Weiss A, Buchman AS, Bennett DA, Giladi N, Hausdorff JM. Association between performance on timed up and go subtasks and mild cognitive impairment: Further insights into the links between cognitive and motor functions. *J Am Geriatr Soc* 2014;62: 673- 8
- McGough EL, Kelly VE, Logsdon RG, McCurry SM, Cochrane BB, Engel JM et al. Associations between physical performance and executive function in older adults with mild cognitive impairment : gait speed and the timed “up & go” test. *Phys Ther* 2011;91:1198-207.
- Boutin T, Kergoat MJ, Latour J, Massoud F, Kergoat H. Vision in the global evaluation of older individual hospitalized following a fall. *J Am Med Dis Assoc* 2012;13:187.
- Tsai LY, Tsay SL, Hsieh RK, Yu S, Tsai JM, Chiem H. Falls injuries and related factors of elderly patients at a medical centre in Taiwan. *International Journal of Gerontology* 2013;8:203-8.

ORIGINAL PAPER

Histopathological study of carcinoma stomach in Assam

Baruah Sampriti¹, Talukdar Leena², Bhattacharjee SS³, Das Mili⁴, Chaubey Jyoti⁵, Saharia Jahnabi⁶, Datta Debashis⁷

Received on April 22, 2018; editorial approval on June 06, 2018

ABSTRACT

Introduction: Gastric cancer accounts for one of the most common cancers worldwide. Adenocarcinoma is the most common type of malignancy of the stomach comprising more than 90% of all gastric cancers. Incidence and pattern of gastric cancer varies amongst various geographical regions and ethnic groups. **Aim:** The present study was done to know the histopathological spectrum of carcinoma stomach. **Methods:** 40 cases of gastric carcinoma were collected over a period of one year (from June 2015 to May 2016). The cases included 26 endoscopic biopsies and 14 partial gastrectomy specimens. Diagnosis was made by the histopathologic examination of H & E stained slides. **Results:** In our study all 40 cases were adenocarcinoma. Ulcerative growth was the most common growth type macroscopically (65%) and the most common location of tumor being the antrum (67.5%). According to Laurens classification, intestinal types predominated in our study (77.5%). According to WHO classification, tubular adenocarcinoma was the most common (60%). Most of the carcinomas in this study were found to be poorly differentiated types (57.5%). **Conclusion:** This study will prove to be useful to know the histopathological spectrum of carcinoma stomach in different geographical locations.

Keywords: Gastric adenocarcinoma, intestinal type

INTRODUCTION

Gastric cancer is the fifth most common malignancy in the world with almost one million new cases diagnosed in the year 2012. More than 70% of the cases (677,000 cases) occur in developing countries and half of these cases alone occurs in Eastern Asia, mainly in China.¹ Adenocarcinoma is the most common malignancy of the stomach and accounts for more than 90% of the cases. Certain predisposing factors like H. pylori, intestinal metaplasia and dysplasia are associated with gastric carcinoma.²

The incidence of gastric cancer has been relatively higher in Southern India, particularly in Chennai. However, recent data indicates that the incidence rates are the highest in the north-eastern region of the country.³ The etiology of gastric cancer is multi-factorial. There are large geographic variations in the incidence of gastric cancer and these may be related to environmental and dietary factors. Apart from dietary factors, such as excessive intake of salt and food containing nitroso-compounds, cigarette smoking and H. pylori infection have been regarded as environmental factors contributing to gastric carcinogenesis.^{4,5}

Various studies on different aspects of gastric cancer are done in India. However in this part of our country studies done on gastric cancer are sparse. In our institution, in recent times, no such study on gastric cancer has been done. This study has been carried out in the Department of Pathology in association with Department of Surgery and Medicine, Silchar Medical College and Hospital to study the histopathological

Address for correspondence:

¹Demonstrator of Pathology, Tezpur Medical College, Tezpur, Assam, India

Email: baruahsampriti@gmail.com

Mobile: +919435563130

²Associate Professor (**Corresponding Author**)

Department of Pathology

Email: dr.leenatalukdar@gmail.com

Mobile: +91 7002202563

³Associate Professor, Department of Surgery

Silchar Medical College, Assam, India

⁴Bishalgarh Sub-divisional Hospital, Agartala, Tripura, India

⁵GDMO, Pathology, Silchar Medical College, Assam, India

⁶Senior Resident, Hematology, Guwahati Medical College and Hospital, Guwahati, Assam, India

⁷Professor, Department of Pathology, Silchar Medical College, Assam, India

Cite this article as: Baruah Sampriti, Talukdar Leena, Bhattacharjee SS, Das Mili, Chaubey Jyoti, Saharia Jahnabi, Datta Debashis. Histopathological study of carcinoma stomach in Assam. *Int J Health Res Medico Leg Prae* 2018 July;4(2):53-57. DOI 10.31741/ijhrmlp.v4.i2.2018.13

pattern of gastric carcinoma from endoscopic biopsy samples of symptomatic patients and from gastrectomy specimens of diagnosed cases of carcinoma of stomach admitted to the hospital.

Aims: To study the histopathological pattern of carcinoma stomach of patients at Silchar Medical College and Hospital.

METHODS

The present study was conducted in the Department of Pathology, Silchar Medical College and Hospital over a period of one year (from June 2015 to May 2016). As Silchar Medical College is one of the pioneers Medical Institute of Assam, the patients from all over Assam attend this institute for treatment. Therefore the study done on histopathological pattern of carcinoma stomach in Silchar Medical College will reflect the histopathological pattern of carcinoma stomach in Assam. Ethical clearance of the study was obtained from the institute. Relevant clinical data of the cases were obtained from the case sheets. 40 cases selected for the study which included both endoscopic biopsy cases (28) as well as gastrectomy specimens (12). The gross study included both topography and macroscopic types. Macroscopically tumors were classified as ulcerative, polypoid, fungating and infiltrative types. Microscopical studies of the cases were done by examination of Hematoxylin and Eosin stained sections. Special stains like PAS and Alcian Blue and immunohistochemistry was done whenever indicated. Tumors were classified histopathologically both according to Lauren as well as WHO subtypes. Statistical software SPSS Version 18 was used for analysis of the data and Microsoft Office Word and Excel 2007 have been used to generate graphs, tables etc. Results were expressed as percentage and simple frequency.

RESULTS

In our study, we obtained 40 cases of gastric carcinoma. Microscopically all the cases were found to be adenocarcinoma. The results and observations of the study on these 40 cases are presented below.

Table 1 Table showing age distribution of cases

AGE GROUP	NO. OF CASES	PERCENTAGE OF CASES
21-30	1	2.5%
31-40	5	12.5%
41-50	12	30%
51-60	12	30%
61-70	6	15%
71-80	3	7.5%
81-90	1	2.5%
TOTAL	40	100%

The analysis of the age distribution shows that age of the patients included in the study ranged from 25 to 82 years with a mean age of 53.8 ± 11.7 years. The most common age group was found to be 41 to 50 years as well as 51 to 60 years (30% each), followed by 61 to 70 years (15%). In our study, least number of patients was found among 21-30 age groups and 81-90 age groups (2.5% each).

Table 2 Gender distribution of cases

SEX	NO. OF CASES	PERCENTAGE OF CASES
MALE	26	65%
FEMALE	14	35%
TOTAL	40	100%

From the above table, it is seen that of the 40 cases, 26 cases (65%) were males and 14 cases (35%) were females; the male to female ratio being 1.86:1.0

Table 3 Table showing distribution of location of gastric carcinoma

LOCATION OF TUMOR	NO. OF CASES	PERCENTAGE OF CASES
CARDIA	5	12.5%
FUNDUS	4	10%
BODY	4	10%
ANTRUM	27	67.5%
TOTAL	40	100%

From **Table 3**, it is evident that antral tumors were the most common (67.5%), followed by tumors of the cardia (12.5%) and tumors of fundus and body each constituted 10% of the total.

Table 4 Distribution of macroscopic appearances of carcinoma stomach

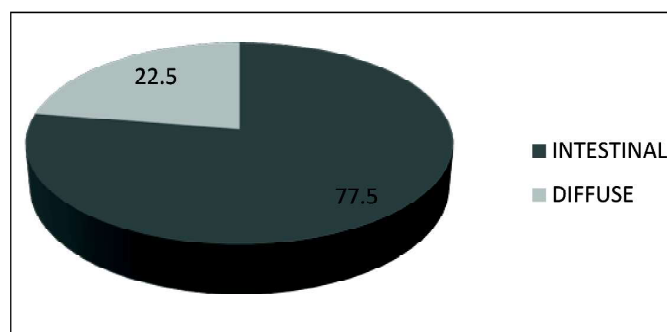
MACROSCOPIC APPEARANCE	NO. OF CASES	PERCENTAGE OF CASES
ULCERATIVE	26	65%
POLYPOIDAL	2	5%
FUNGATING	2	5%
INFILTRATIVE	10	25%
TOTAL	40	100%

From Table 4, it is seen that maximum cases had an ulcerative growth (65%), followed by infiltrative growth (25%) while polypoidal and fungating growths each constituted only 5% of the total cases.

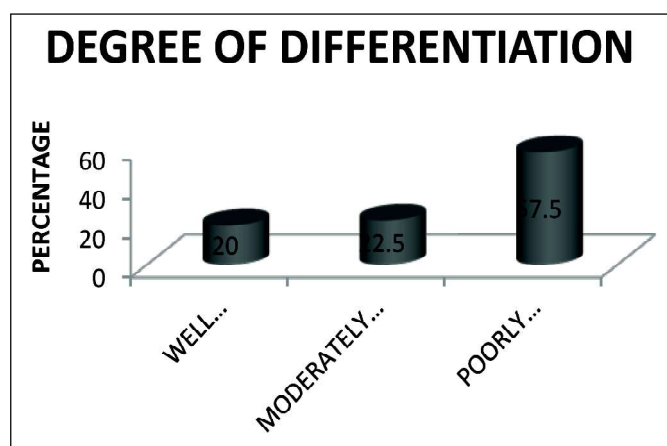
Table 5 Distribution of WHO histological types

WHO HISTO-LOGICAL TYPE	NO.OF CASES	PERCENTAGE OF CASES
TUBULAR	24	60%
PAPILLARY	2	5%
MUCINOUS	5	12.5%
POORLY COHESIVE	9	22.5%
TOTAL	40	100%

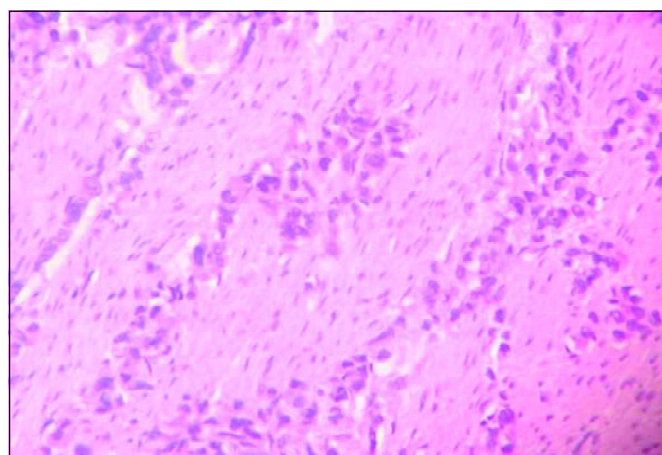
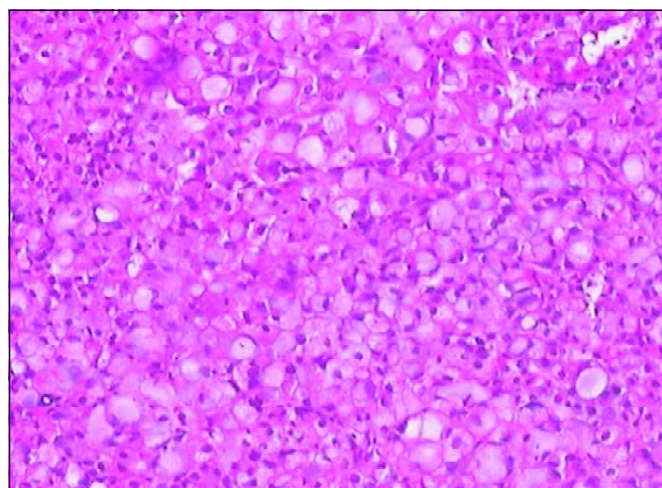
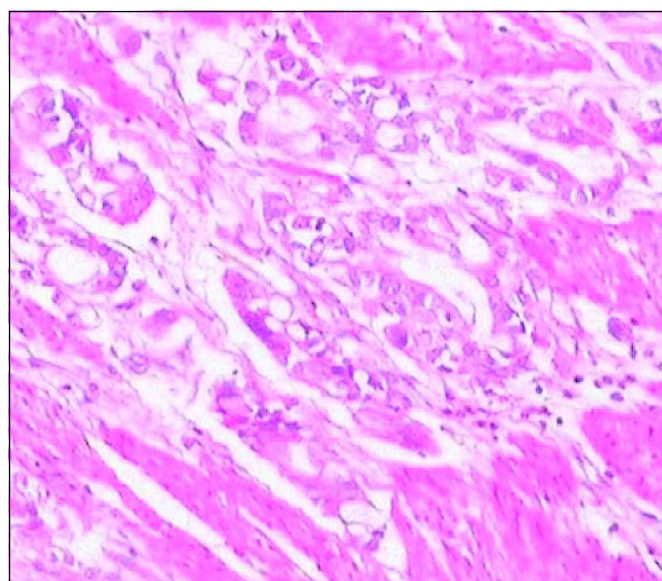
From table 5, it is seen that out of the 40 gastric adenocarcinomas, maximum were of tubular type (60%), followed in decreasing frequency by poorly cohesive (22.5%), mucinous (12.5%) and papillary adenocarcinoma (5%).

**Figure 1** Pie diagram showing distribution of cases as per Lauren's classification

It is seen that in our study majority of the gastric adenocarcinomas were of the intestinal type (77.5%). The diffuse type constituted only 22.5% of the total cases.

**Figure 2** Diagram showing distribution of cases according to degrees of differentiation

From figure 2, it is seen that in our study maximum cases were poorly differentiated (57.5%) followed by moderately differentiated cases (22.5%) and least number of well differentiated cases (20%).

**Figure 3** Diffuse carcinoma of stomach**Figure 4** Signet ring cell adenocarcinoma of stomach**Figure 5** Intestinal type of gastric carcinoma (well differentiated type)

DISCUSSION

Gastric cancer accounts for one of the most common cancers worldwide. Adenocarcinoma is the most common type of malignancy of the stomach and comprises more than 90% of all gastric cancers. Incidence and pattern of gastric cancer varies amongst various geographical regions and ethnic groups. Various studies on gastric cancer were conducted in different parts of the world.

Our study included a total of 40 gastric carcinoma cases. All cases were found to be adenocarcinoma. In our study, of the 40 cases of gastric carcinoma, age of the patients ranged from 25-82 years with a mean age of 53.8 ± 11.7 years. Shan et al.⁶ studied a total of 1463 patients of gastric and gastroesophageal junction adenocarcinoma in Beijing, China, between August 2009 and February 2012 and they found that the median age of patients in their study was 58 years. The age of their study population ranged from 20 to 82 years. Tewari et al.⁷ in their study on 70 gastric and gastroesophageal junction adenocarcinoma between 2010 to 2012, in Varanasi, U.P. found a mean age of 52.97 ± 7.08 years of the patients in their study. The age of patients ranged from 30 to 71 years.

In the present study, of the 40 cases, 26 were males and 14 were females, showing a clear male preponderance (65%). The male to female ratio being 1.86:1.0. Our study is in accordance with the studies of Rajagopal et al.⁸ and Lee et al.⁹

In our study the most common location of gastric carcinoma was antrum (67.5%), followed by cardia (12.5%) and fundus and body tumors each constituted 10% of the total. This is in concordance with the studies of Rajagopal et al.⁸ and Begnami et al.¹⁰ where it was found that distal tumors were the maximum (79%) in their study.

In the present study, we found that maximum cases had an ulcerative growth (65%), followed by infiltrative growth (25%) and fungating and polypoidal growths each constituted of 5% of the total. Saha et al.¹¹ (2013) in their study on a total of 462 cases in West Bengal, found that ulcerative lesion (57.8%) was the most common. Dewan et al.¹² (2015) conducted a study on 100 cases of gastric adenocarcinoma, in New Delhi, found that most of the tumors (83%), were of the ulcerating type on gross examination. In our study all cases were adenocarcinomas of which 60% cases were of tubular type, followed by poorly cohesive type (22.5%), mucinous (12.5%) and papillary type (5%). Calik et al.¹³ in their study on 84 patients who were diagnosed with gastric cancer at the Hospital of the Faculty of Medicine, Ataturk University, Turkey, between August 2003 and June 2013, found that tubular adenocarcinoma was the most common histological subtype consisting of 62 cases (73.8%).

In the present study, we found that majority of the tumors were of intestinal type (77.5%). Diffuse tumors constituted only 22.5% of the cases. We found no mixed type of tumor in our study which may be due to our small study population. Movagharnjad et al.¹⁴ carried out a study on 60 cases of

gastric adenocarcinoma, during 2010-2011 in Iran. They found that 42 cases were of intestinal subtypes (72%) and 18 cases were of diffuse subtypes (30%) in their study. Rajagopal et al.⁸ in their study on 60 cases of gastric adenocarcinoma in Bengaluru, found that 81.7% of tumors were of intestinal type and the rest were of diffuse type (18.3%). The present study is in accordance with other studies published.

In the present study, we found that of the 40 cases, most of the cases were poorly differentiated type (57.5%), followed by moderately differentiated type (22.5%) and least number of well differentiated type (20%). Begnami et al.¹⁰ in their study on 221 patients of gastric cancer found that poorly differentiated tumors were the most common (59%), followed by moderately differentiated tumors (33%) and well differentiated tumors (8%). Calik et al.¹³ in their study on 84 gastric cancer patients, found that poorly differentiated tumors were most common (53.4%), followed by moderately differentiated ones (39.3%) and well differentiated ones (8.3%).

However Rajagopal et al.⁸ in their study found that moderately differentiated tumors were the most predominant (66.7%) followed by poorly differentiated (18.3%) and well differentiated type (15%). The present study is in accordance with the findings of Begnami et al.¹⁰ and Calik et al.¹³

CONCLUSION

Gastric cancer is one of the leading causes of cancer related deaths worldwide. Etiology of gastric cancer is varied and comprises of environmental, social and genetic factors. The pattern of gastric cancer also varies according to different geographical locations. The prognosis of gastric cancer patients remains poor despite advanced chemotherapy regimes. Therefore extensive studies considering large number of cases should be carried out to know the histopathological patterns and also risk factors associated with its causation.

Acknowledgements: Grateful acknowledgement to Dr. Dharmakanta Kumbhakar, Associate Professor, Dept. of Pathology, Tezpur Medical College and Hospital for his guidance in carrying out this study.

Conflict of Interest: None declared.

Ethical Clearance: Taken.

Source of funding: None declared.

Contribution of Authors: We declare that this work was done by the author(s) named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer* 2015 March 1;136(5): E359-86.
2. Dikshit R, Gupta P, Ramasundarahettige C, Gajalakshmi V, Aleksandrowicz L, Badwe R et al. Cancer mortality

- in India. A nationally representative survey. *Lancet* 2012;379(9828):1807-16.
3. NCRP (2009) Two-year report of the population based cancer registries-2006-2008. National cancer registry programme, Indian council of medical research (ICMR), Bangalore, India, 2009.
 4. Tredaniel J, Boffetta P, Buiatti E, Saracci R, Hirsch A. Tobacco smoking and gastric cancer: review and metaanalysis. *Int J Cancer* 1997;72: 565 – 573.
 5. Correa P. Human gastric carcinogenesis: a multistep and multifactorial progression. *Cancer Res* 1992;52:6735 – 6740.
 6. Shan L, Ying J, Lu N. HER2 expression and relevant clinicopathological features in gastric and gastroesophageal junction adenocarcinoma in a Chinese population. *Diag Pathol* 2013; 8:76.
 7. Tewari M, Kumar A, Mishra RR, Kumar M, Shukla HS. HER2 Expression in Gastric and Gastroesophageal Cancer: Report from a Tertiary Care Hospital in North India. *Indian J Surg*. 2013.
 8. Rajagopal I, Niveditha SR, Sahadev R, Nagappa PK, Rajendra SG. HER 2 expression in gastric and gastroesophageal junction (GEJ) adenocarcinomas. *J Clin Diagn Res* 2015 Mar 1;9:EC06-10.
 9. Lee KE, Lee HJ, Kim YH, Yu HJ, Yang HK, Kim WH, et al. Prognostic Significance of p53, nm23, PCNA and c-erbB-2 in Gastric Cancer. *Jpn J Clin Oncol* 2003;33(4):173–179.
 10. Begnami MD, Fukuda E, Fregnani JHTG, Nonogaki S, Montagnini AL, da-Costa JWL. Prognostic Implications of Altered Human Epidermal Growth Factor Receptors (HERs) in Gastric Carcinomas: HER2 and HER3 Are Predictors of Poor Outcome. *J Clinl Oncol* 2011;29(22):3030-3036.
 11. Saha AK, Maitra S, Hazra SC. Epidemiology of Gastric Cancer in the Gangetic Areas of West Bengal. *ISRN Gastroenterology* 2013.
 12. Dewan K, Madan R, Sengupta P. Correlation of Lauren's histological type and expression of E-cadherin and HER-2/ neu in gastric adenocarcinoma. *Int J Pathol Lab Med* 2015;1(1):OA2.
 13. Çalik M, Dermirci E, Altun E, Çalik I, Gundogdu OB, Gursan N. Clinicopathological importance of Ki-67, p27, and p53 expression in gastric cancer. *Turkish J Med Sc* 2015;45:118-128.
 14. Movagharnejad K, Sharbatdaran M, Sheffae S, Kashifard M, Sedaghat S. HER-2/neu Marker Examination using Immunohistochemical Method in Patients Suffering from Gastric Adenocarcinoma. *Int J Mol Cell Med Autumn* 2013;2(4).

ORIGINAL PAPER

Emotional problems and coping strategies of senior citizens

Sarma Krishnakshi¹, Bhuyan Hemeswari², Saikia Kaberi³

Received on April 21, 2018; editorial approval on June 17, 2018

ABSTRACT

Introduction: Depression and stress of senior citizens is an important public health challenge in developing countries and in an attempt to counteract the emotional problems person develops individual pattern of coping. **Aim:** To assess and compare the emotional problems and coping strategies of senior citizens living in old age home and with family.

Methods: Descriptive quantitative approach and Non experimental, comparative descriptive design was selected and 60 (30 each from old age home and family) samples were drawn by consecutive sampling technique. **Results:** Majority of senior citizens from family setting had average low level of stress 10 (16.7%), whereas most of the senior citizens from old age home setting had high level of stress 11 (18.3%). Majority of senior citizens from family 15 (25%) as well as old age home setting 22 (36.7%) had suggestive of mild depression. In family (mean=7.17) as well as old age home (mean=7.33) setting subscale religion has the highest mean. **Conclusion:** High level of stress and mild depression of elderly living in old age home and mild depression of elderly living in family should be considered an important concern for geriatric group of population in Assam.

Keywords: Senior citizens, emotional problems, coping strategies.

INTRODUCTION

Ageing is universal biological process experienced by all creatures including human beings. People age differently and experience aging differently based on heredity, lifestyle, and attitudes.¹ Old age is the most vulnerable period of life. The world is rapidly aging; the number of people aged 60 and over as a proportion of the global population will double from 11% in 2006 to 22% by 2050.²

The aged feel a sense of social isolation because of the disjunction from various bonds viz., work relationships, and

diminish of relatives and friends, mobility of children to far off places for jobs.³ The elderly people face number of problems and adjust to them in varying degrees in their old age. These problems range from absence of ensured and their dependents, to ill-health, absence of social security, loss of social role and recognition, and the non-availability of opportunities for creative use of free time.⁴

Depression decreases an individual's quality of life and increases dependence on others. Geriatric populations with depression are at a higher risk for chronic diseases like coronary heart disease (CHD), cancer, diabetes mellitus and hypertension.⁵ At any age, stress is a part of life. Stress comes in two basic flavors, physical and emotional- and both can be especially taxing for older people. Overloads of stress hormones have been linked to many health problems, including heart disease, high blood pressure, and weakened immune function.⁶

In an attempt to neutralize or counteract the emotional problems person develops individual pattern of coping which is termed as coping mechanism. Lazarus and Folkman (1984) suggested two types of coping responses emotion focused and problem focused: Emotion-focused coping involves trying to reduce the negative emotional responses associated with stress whereas problem focused strategies aim to remove or reduce the cause of the stressor.⁷

Address for correspondence:

¹PGT, M.Sc. Nursing (**Corresponding Author**)

Email: sarmakrishnakshi@gmail.com

Mobile: +918473993118

²Associate Professor

Community Health Nursing

³Principal (I/C) cum Professor and HOD

Public Health Nursing

Regional College of Nursing

Guwahati-32, Assam, India

Cite this article as: Sarma Krishnakshi, Bhuyan Hemeswari, Saikia Kaberi. Emotional problems and coping strategies of senior citizens. *Int J Health Res Medico Leg Prae* 2018 July;4(2):58-62. DOI 10.31741/ijhrmlp.v4.i2.2018.14

MATERIAL AND METHODS

The study design was non experimental comparative descriptive design conducted at 4 selected old age homes and 4 villages of Kamrup Metro, Assam. Senior citizens who have fulfilled the inclusion criteria were selected as samples and sample size consist of 60 elderly i.e., 30 from old age homes and 30 from families by consecutive sampling technique. The tool selected for the study was divided into 4 sections: Section 1 –contains demographic variables – age, gender, educational status, marital status, previous occupation, family type and religion. Section 2 – it consists of perceived stress scale (PSS) which is the most widely used psychological instrument for measuring the perception of stress which was published in 1983. The author of the PSS is Sheldon Cohen. Section 3 –it consists of geriatric depression scale (GDS) short version developed by Jerome A. Yesavage MD & Javid I. Sheikh in 1986. Section 4 – it consists of brief COPE inventory developed by Charles S. Carver. Data collection was done through self administered questionnaire method from 13th March to 31st March, 2017. The analysis was done by using descriptive and inferential statistics. Under descriptive statistics, percentage, mean and standard deviation were calculated. Under inferential statistics, t - test and multivariate ANOVA test was used to compare and to find association between emotional problems and coping strategies of senior citizens living in old age home and with family.

RESULT

Regarding socio demographic variables most of the elderly from family setting were female 20 (66.66%) and also majority of elderly from old age home were female 24 (80%).

Most of the elderly from family setting were within the age group of 60-69 years of age 16 (53.33%), whereas majority of the elderly from old age homes were within the age group of 70-79 years of age 16 (53.33%).

Most of the elderly from family were married 15 (50%), whereas majority of the elderly from old age home were widow/widower 20 (66.66%).

Educational statuses of most of the elderly from family setting were found to be educated up to lower primary level 16 (53.33%) whereas elderly from old age home studied up to upper primary level 9 (30%).

Previous occupation of most of the elderly from family setting were daily wage earner 9 (30%) and service 9 (30%), whereas majority of the elderly from old age home setting were doing business 11 (36.67%).

Most of the elderly from family 16 (53.33%) and old age home setting 20 (66.67%) were from joint family.

Most of the elderly from family 28 (93.33%) and old age home setting (96.67%) were Hinduism religion.

Regarding stress (Table 1) majority of senior citizens from family setting had average low level of stress 10 (16.7%), whereas most of the senior citizens from old age home setting had high level of stress 11 (18.3%).

Table 1 Distribution of the level of stress among participants n = 60, (30+30)

Sample participant	Level of stress	Score range	Frequency	Percentage (%)	Mean	SD
Family	Very low	4-7	4	6.7	14.3	6.909
	Average low	8-11	10	16.7		
	Average	12-15	4	6.7		
	High	16-19	6	10.0		
	Very high	21-29	6	10.0		
	Total	4-29	30	50.0		
Old age Home	Very low	0-3	2	3.3	17.70	6.519
	Average low	11-11	2	3.3		
	Average	12-15	6	10.0		
	High	16-20	11	18.3		
	Very high	22-27	9	15.0		
	Total	0-27	30	50.0		
Total	Very low	0-7	6	10.0	16.00	6.877
	Average low	8-11	12	20.0		
	Average	12-15	10	16.7		
	High	16-20	17	28.3		
	Very high	21-29	15	25.0		
	Total	0-29	60	100.0		

Regarding depression (Table 2) majority of senior citizens from family 15 (25%) as well as old age home setting 22 (36.7%) had suggestive of mild depression.

Table 2 Distribution of the depression among participants n = 60, (30+30)

Sample Participant	GD Grade	Score range	Frequency	Percentage (%)	Mean	SD
Family	No depression	0-4	13	21.7	5.30	3.436
	Suggestive of a mild depression	5-10	15	25.0		
	Suggestive of severe depression	11-12	2	3.3		
	Total	0-12	30	50.0		
Old Age Home	No depression	1-4	4	6.7	7.73	2.664
	Suggestive of a mild depression	6-10	22	36.7		
	Suggestive of severe depression	12-12	4	6.7		
	Total	1-12	30	50.0		
Total	No depression	0-4	17	28.3	6.52	3.286
	Suggestive of a mild depression	5-10	37	61.7		
	Suggestive of severe depression	11-12	6	10.0		
	Total	0-12	60	100		

Regarding coping strategies (Table 3) in family (mean=7.17) as well as old age home (mean=7.33) setting, subscale religion had the highest mean. On the other hand in family (mean=3.03) as well as old age home (mean=3.27) setting,

subscale humor had the lowest mean. Hence, most of the senior citizen from family as well as old age home setting were using religious coping.

Table 3 Mean & SD of subscales of the coping strategies n = 60, (30+30)

Coping strategies	Family		Old age home	
	Mean	Std. deviation (SD)	Mean	Std. deviation (SD)
Self distraction	5.1	2.07	6.5	1.5
Active coping	6.77	1.43	6.83	1.44
Denial	3.5	1.61	4.53	1.94
Substance use	3.13	2	3.93	2.24
Use of emotional support	4.5	2.22	6.43	1.17
instrumental support	4.5	2.15	5.67	2.06
Behavior disengagement	4.43	1.77	4.13	1.78
Venting	4.77	1.45	5.23	1.87
Positive reframing	4.17	1.58	4.93	1.95
Planning	5.73	2.15	5.33	2.06
Humor	3.03	1.61	3.27	1.51
Acceptance	7.17	1.09	6.4	1.87
Religion	7.7	0.79	7.33	1.37
Self blame	4.5	1.85	4.8	2.07

Regarding comparison of stress, depression and coping strategies of senior citizens living in old age home and families, stress was found to be non significant at $t=1.96, p>0.05$ whereas depression and coping strategies were found to be significant at $t=3.07, (p=.003)$ and $t=2.56 (p=.013)$ respectively.

Among the subscales of coping strategies, self distraction, denial, use of emotional support and use of instrumental support were significant for senior citizens living in old age home and family with $t=2.99, 2.24, 4.22$ and 2.15 respectively, $p>0.05$. whereas subscale active coping, substance use, behavior disengagement, venting, positive reframing, planning, humor, acceptance, religion and self blame were non significant for senior citizens living in old age home and family with $t=0.18, 1.46, 0.65, 1.08, 1.68, 0.74, 0.58, 1.94, 1.27, 0.59$ respectively.

For senior citizens living in family stress, depression and coping strategies are independent of variable gender whereas for senior citizens living in old age home stress and depression are independent of variable gender but there is association of coping strategies with gender at $F=31.056 (p=0.001)$.

For senior citizens living in family stress and depression are independent of variable age but there is association of coping strategies with age at $F=3.8 (p=0.043)$ whereas for senior citizens living in old age home stress and depression are independent of variable age but there is association of coping strategies with age at $F=9.308 (p=0.003)$.

For senior citizens living in family stress, depression and coping strategies are independent of variable marital status whereas for senior citizens living in old age home stress and depression are independent of variable marital status but there is association of coping strategies with marital status at $F=4.078 (p=0.028)$.

For senior citizens living in family stress, depression and coping strategies are independent of variable educational status whereas for senior citizens living in old age home stress and coping strategies are independent of variable educational status but there is association of depression with educational status at $F=6.159 (p=0.004)$.

For senior citizens living in family stress, depression and coping strategies are independent of variable previous occupation whereas for senior citizens living in old age home stress and depression are independent of variable previous occupation but there is association of coping strategies with previous occupation at $F=10.763 (p=0.001)$.

For senior citizens living in family as well as old age home stress, depression and coping strategies are independent of variable family type.

For senior citizens living in family stress, depression and coping strategies are independent of variable religion whereas for senior citizens living in old age home stress and coping strategies are independent of variable religion but there is association of depression with religion at $F=5.153 (p=0.040)$.

DISCUSSION

In the present study it is observed that most of the elderly had high level of stress, i.e., 17(28.3%). Majority of senior citizens from family setting had average low level of stress 10(16.7%), whereas most of the senior citizens from old age home setting had high level of stress 11(18.3%). Also majority of the subjects 37(61.7%) had mild depression followed by 17(28.3%) had no depression and 6(10.0%) were having severe depression. Majority of senior citizens from family 15(25%) as well as old age home setting 22(36.7%) were suggestive of mild depression.

The findings of the present study is contradicted by a study done by Maddepalli U⁸ at Golagamudi, Nellore which showed that among the elderly 3(3%) had mild stress, 86(86%) had moderate stress and 11(11%) had severe stress. The study is supported by a study done by Timalisina R⁹ at old age homes of Nepal which showed that regarding their depression level, 47(27.2%) respondents were normal and 126(72.8%) had depression. Out of these 126 respondents, 98(56.6%) and 28(16.2%) respondents had mild and severe depression.

In the present study it was observed that among the subscales of coping strategies in family (mean=7.17) as well as old age home (mean=7.33) setting, subscale religion had the highest mean. On the other hand in family (mean=3.03) as well as old age home (mean=3.27) setting, subscale humor had the lowest mean.

The findings of the present study is similar to a study conducted by Kasi PM¹⁰ at Karachi, Pakistan where of the 14 coping styles studied, the most frequently used strategies was religion (48.1%) and the least used coping strategies was humor (9.6%).

In the present study while comparing the stress no significant difference was found between stress of senior citizen living in old age home and living with family at $t=1.96, p=0.055$. Whereas for depression in elderly it is found that there was significant difference in the mean score of depression of elderly living in old age home and living with family at $t=3.07, p=0.003$.

The finding of the present study is supported by a study conducted by Manpreet S¹¹ at selected old age homes and community of Ambala, Chandigarh and Kurukshetra where significant difference was found in mean value of elderly living in old age home and community at $t=5.693, p<0.05$.

In the present study while comparing the coping strategies in elderly significant difference was found in the mean score of coping strategies of elderly living in old age home and living with family at $t=2.56, p=0.013$.

It is similar to a study conducted by Singh R¹² to compare the coping strategies adopted by the institutionalized and home living elderly of Kathmandu, Nepal. It was found that there was significant difference in mean scores of the elderly living in institutional and home settings for coping strategies as $t=7.39, p<0.01$.

In the present study it was found that for senior citizens living in family Stress and depression did not have association with any of the demographic variables. For senior citizens living in old age home there was significant association of depression with education status ($F=6.159$, $p=.004^{**}$) and religion ($F=5.153$, $p=.040^{*}$). Stress did not have any association with any of the variables.

A study conducted by Ranjan S et al.¹³ in an old age home in Kathmandu showed that there was no association of depression with age, gender, educational status, marital status, psychological support, financial support, reason for leaving home and length of stay. On the other hand significant association was found between depression with history of physical illness.

In the present study it was found that for senior citizens living in family there is significant association of coping strategy with age ($F=3.800$, $p\text{ value}=0.043$). On the other hand for senior citizens living in old age home there is significant association of coping strategies with gender ($F=31.056$, $p=.001^{**}$), age ($F=9.308$, $p=.003^{**}$), marital status ($F=4.076$, $p=.028^{*}$), and previous occupation ($F=10.763$, $p=.001^{**}$).

Another study done by Singh R¹² to compare the coping strategies adopted by the institutionalized and home living elderly of Kathmandu, Nepal. They found that in institutional elderly coping strategy was significantly associated with education status, monthly income and interpersonal relations but in case of elderly in home setting coping strategies were significantly associated with present job status, monthly income and type of family.

CONCLUSION

The study showed that most of the elderly from family had average low level of stress but majority of the elderly from old age home had high level of stress. Majority of elderly from family and old age home had mild depression and uses religious coping.

Conflict of interest: None.

Ethical clearance: Taken.

Author declaration: We declare that this work is done by the authors named in this article and all liabilities pertaining to the claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Arya K, Arya L. Attitude of youngsters towards the aged people. *Praachi J of psycho-cultural Dimensions* 2006;22(1):54-5.
2. Mehrotra, S. Batish. Assessment of Problems among Elderly Females. *J Hum Ecol* 2009;28(3):213-6.
3. Park k. Preventive medicine and geriatrics. Preventive and Social medicine. 23rd ed. Jabalpur: M/s Banarsidas Bhanot publishers; 2015.p.594-5.
4. Tolkein JRR. Retirement and old age. *Wikipedia,org* Aug, 2010. [cited 2016 May 30]; Available from: URL:http://en.wikipedia.org/wiki/JRR_Tolkien#Retirement_and_old_age
5. Pilania M, Bairwa M, Kumar N, Khanna P, Kurana H. Elderly depression in India: an emerging public health challenge. *Australas Med J*. 31st march, 2013. [cited 2016 May 30]; Available from: URL:<http://dx.doi.org/10.4066/AMJ.2013.1583>
6. Woolston C. Ageing and stress. *Healthday.com*. Jan 20, 2016. [cited 2016 May 30]; Available from: URL:www.googleweblight.com
7. Leod SM. Stress Management. *Simplypsychology.org* 2015. [cited 2016 May 30]; Available from: URL:www.simplypsychology.org/stress-management.html#em
8. Maddepalli U, Kumari BV, Indira A, Kantha K. Level of stress among elderly at selected old age homes in Nellore. *Int J of Applied Research* 2016;2(6):820-2.
9. Timalisina R, Sherpa P D, Dhakal D K. Factors Associated with Depression among Elderly Living in Old Age Homes in Kathmandu Valley. *J of Inst of Med*, April 2014;36(1):90-6.
10. Kasi PM, Naqvi H, Afgan AK, Khawar T, Khan F, Khan UZ et al. Coping Styles in Patients with Anxiety and Depression. *ISRN Psychiatry* 2012;39(3):12-7.
11. Manpreet S, Tarika. Comparative study to assess & compare depression among elderly population living in selected old age. *Int J of Multidiscip Resea and Dev* 2016;3(8):318-20.
12. Singh R, Mahato S. Coping strategies adopted by the institutionalised and non-institutionalised elderly in Kathmandu, Nepal: A comparative correlational study. *Int J Res Dev Health* March 2014;2(1):11-8.
13. Ranjan S, Bhattarai A, Dutta M. Prevalence of depression in elderly people living in old age home in the capital city Kathmandu. *Health Renaissance* 2013;11(3):213-8.

ORIGINAL PAPER

Tila taila as sneha abhyanga in sandhigataavata for swelling to prove the theory "Snehat Vatam Smayati"

Kalita Upen¹, Deka Himamoni², Barman Niten³

Received on December 12, 2015; editorial approval (revised) on December 30, 2017

ABSTRACT

Introduction: Ayurveda is the science of life as well as the longevity. Its aim is to preserve the positive health of a healthy person and to cure the disease of the diseased one. whole treatment is based on two siddhantas only- samanya siddhanta and vishesh siddhanta. Out of these, guna vishesh siddhanta which is related to opposite guna, was taken to see the role of tila taila as sneha abhyanga (external massage) in Sandhigataavata in relation to swelling and to prove the theory "Snehat Vatam Smayati". **Methods:** 30 patients of Sandhigataavata, age 40 – 70 years were selected randomly from OPD and IPD of Govt. Ayurvedic College & Hospital. **Results:** In the series of trial for 21 days, swelling was relieved faster than other sign and symptoms. Swelling before treatment mean \pm SD was $1.10 \pm .662$ and after 21 days of treatment declined to $.40 \pm .498$ ($p < .001$). Statistically it showed a high significant result corresponding to indication of a highly effective intervention for decrease in swelling. **Discussion:** This study was found to be in consistent with other studies carried out in different parts of the world. **Conclusion:** Statistically significant results indicates effective intervention of Til Taila for decrease in the symptom of swelling in Sandhigataavata (OA). This study may be used as a baseline study for more advanced studies.

Keywords: Abhyanga, Sotha, Tila taila, Snehana, Guna, Vata-Dosh

INTRODUCTION

"Ayu" means life and "veda" means knowledge. So Ayurveda is the science of life as well as the longevity.^{1,2} Health and disease are two opposite diversion of life. The present work has been undergone as a clinical and demographic study to establish the effectiveness of sneha abhyanga in a group of 30 patients for management of sandhigataavata in relation to sotha (swelling) in terms of gunavishesh siddhanta. The aggravation, alleviation of dosha, dhatu, mala and the entire

treatment is based on this principle only. Charaka (1000 B.C.), Susruta (500 B.C.) and Bhagbhata 400 B.C) are the pioneers in the field of Indian medicine. They have enumerated the principles of diseases of joints. According to ayurveda, combination of two bones is called Sandhi (joint) and it is the root of Majjabaha srota.³ It is composed of Prithivi, Akash and Jala mahabhuta. According to Kashyap Samhita, it is the site of kapha and common site of vata.^{4,5} The indulging dietary habits vitiate vata and obstruct the "sleshak kapha" within the sandhi. As a result it produces pain, swelling, stiffness, tenderness, muscular wasting of the joints leading to sandhigataavata.⁶ While in modern medicine the bony joint commonly a synovial joint (sandhi) consists of mainly these elements- bone, muscle, cartilage, blood vessel, ligaments, tendon, synovial fluid, synovial membrane, synovial cavity etc.^{7,8} In Ayurveda all these structures are known as dhatu/upadhatu.^{9,10} When the dosha gets vitiated, the respective gunas also get affected and ultimately it will affect the dosha of the specific dhatu. So Charaka has given the clinical presentation of sandhigataavata like 'Vatapurnadritisparsha sotha' (if vata gets located in joint swelling occurs like air filled bag in touch) & 'Akunchanaprasarana sabedana' (pain during contraction and extension).

Among the various herbal drugs for Sandhigataavata, a short clinical screening of Til taila has been made to evaluate its

Address for correspondence:

¹ Lecturer, Sharir Kriya Vigyan, Govt. Ayurvedic College

Email: kalitaupen4@gmail.com

Mobile: +919365881458

² Assistant Professor (**Corresponding Author**)

Department of Anatomy

Gauhati Medical College, Guwahati, Assam

Email: dekahimamoni4@gmail.com

Mobile: +919864324646

³ Associate Professor, Sanskrit Samhita and Siddhanta Department, Govt. Ayurvedic college

Cited this article as: Kalita Upen, Deka Himamoni, Barman Niten. Tila taila as sneha abhyanga in sandhigataavata for swelling to prove the theory "Snehat Vatam Smayati". Int J Health Res Medico Leg Prae 2018 July;4(2):27-30.63-65. DOI 10.31741/ijhrmlp.v4.i2.2018.15

efficacy in the form of tail abhyanga in relation to guna vishesh siddhanta, as Charaka said that among the tailas Til taila is the best sneha in pacification of vata dosha.⁸

The objective is to see the effect of Snehana (Til taila) as Abhyanga karma in patients of sandhigatavata in relation to swelling as symptomatic relief.

MATERIAL AND METHODS

The present work was a hospital based observational study in the period from 2012 – 2013. A total number of 30 diagnosed patients both clinically and radiologically were selected in the age group of 40-70 years in a ratio of 1:1 from O.P.D. and I.P.D. of GAC&H, Jalukbari, Guwahati-14, and Assam. Random sample technique was used. Informed consent was taken from patients. Unwilling and seriously ill patients were excluded from the study. Outcomes were evaluated after application of trial drug weekly for 3 weeks. Data analysis were done and graphically represented using bar diagram and mosaic plot.^{11,12}

Assessment of severity of the disease (swelling) was done by following:

Table 1 Grading of severity

Sign and Symptoms (Severity)	Grade (gr)
Absent	0
Mild	1
Moderate	2
Severe	3

Table 2 Gunas of provoked vata dosha in terms of clinical features

Guna of vata	Symptoms	Before Treatment Severity Grades	After Treatment Severity Grades
Ruksha	Atopa (Cracking Sound)		FU-1 FU-2 FU-3
Khara			
Sheeta	Sula (Pain)		
	Stambha (Stiffness)		
	Sotha (Swelling)		
Laghu	Laghuta (Wasting)		
Chala	Prasarana-kunchanasa vedana (Restricted Movement)		

In the present work during examination the classical description found in Brihatrayee and Madhav Nidan is applied. The signs and symptoms described in samhitas which get provoked by the respective gunas of kupita vata in sandhi according to Ayurvedic literacy concept were used.

Preparation and selection of the trial drug:

Preparation of trial drug from crude drugs was done using standard protocols in the state Ayurvedic pharmacy (Rasasala dept.) Govt. Ayurvedic College, Jalukbari, Guwahati-14.

Time of Abhyanga:

- Morning after sunrise, in a circular motion on the affected joint for 15 minutes (with his/her right hand).
- At night before bed, in a circular motion on the affected joint for 15 minutes (with his/her right hand).

RESULTS

The results and observations of the present study are presented as follows :

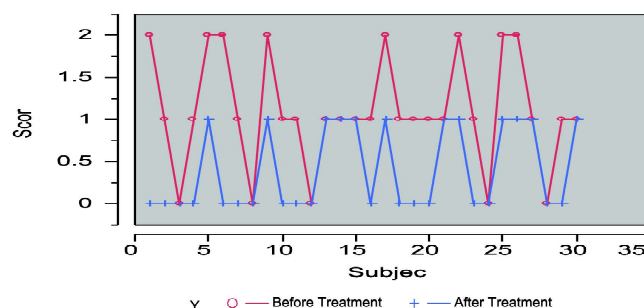


Figure 1 Effect of Til Taila on diagnosed patients of sandhigatavata (OA) before and after treatment representing In a Pareto Plot

Figure 1 depicts that before treatment 5 patients were in grade 0, 17 patients were in grade 1 and 8 patients were in grade 2. Whereas after treatment the number of patients were found to be 18 in grade 0 and 12 in grade 1

Table 3 Effect of trial drug on swelling (n=30)

	Before Treatment	After Treatment	Correlation	P Value	Paired Differences		t	P Value
					Mean	SD		
Mean	1.10	.40	.50**	.005	.70	.60	6.43**	<.001
±SD	±.662	.498						

Significant at P(<.05) ** significant at P(<.01)

Table 3 depicts that swelling before treatment mean±SD was 1.10 ±.662 which after 21 days of treatment declined to .40±.498 (p<.001). Statistically it showed a high significant result corresponding to indication of a highly effective intervention for decrease in the symptom swelling.

DISCUSSION

Study on gunavishesh siddhanta which is based on opposite guna was done by many researcher earlier. The observation

of this present study suggests that the trial drug til taila has a significant effect in vatic disorders like sandhigatavata related to swelling as sneha dravya. Acharya Caraka mentioned that vata is the chief among all the doshas and sneha is the best drug to pacify it for which he also mentioned Snehadhyaya after Vatakalakaliy adhyaya in Sutrasthan. Vagbhat mentioned the properties of taila in penetrating in to the deep tissues and spreading fast throughout the body after abhyanga karma.^{13,14,15} In swelling before treatment the mean was 1.10 and SD was ± 0.662 which is declined to mean 0.40 and SD 0.498 and the p value is < 0.001 which shows a highly statistically significant result. So our intervention is highly effective for decrease the symptom swelling. M. B. Shamloo, Morteza Nasiri, Aazam Dabirian, Ali Bakhtiyari, Faraz Mojab and Hamid Alvai Maid did the experiment of sesame oil as topical use on pain severity of upper and lower extremities trauma with NSAID and found satisfactory result in 2015.¹⁶ Again Mayuri Shah also found the significant result in his study of matra vasti and some indigenous compound including Sesame oil in management of Sandhigatavata in 2006.¹⁷ Correlation between the before treatment and after treatment of swelling shows the significance value of 0.50. So it suggests that there is a relationship between pre and post test which reject H_0 : Reject H_0 if $P < t_a$ when $t_a = t_{0.05}$ setting the level of confidence at 95% probability signifying that if the difference is significant at the level of $P < 0.05$, the hypothesis will be rejected establishing the term “snehat vatam samayati.” Further studies are needed to follow up patients exposed to the trial drug for better result and achievement.

CONCLUSION

The present study is based on a literary and conceptual study. Guna afflicts in our body in terms of clinical features. To study the disease in terms of symptomatology is very easy process, but to study the gunas on some diseases is very difficult. The medical history and clinical examination indicate the affect of gunas. To assess the severity of the disease all signs and symptoms i.e. the qualitative data are converted to quantitative data and are graded into four grades as 0, 1, 2, 3 in terms of getting difficulty as absence, mild, moderate and severe. when a drug is administered to a patient, it acts mainly on the Doshas first and Dhatus next according to the Gunavishesh Siddhanta. Emphasis is also given on the applied aspect of guna for preventing and curing disease. Finally it is also pertinent to mention that State Govt. as well as the Central Govt. has a major role in making development as well as availability of the Ayurvedic herbal quality products to get quality results.

Acknowledgements: We sincerely acknowledge the patients participated in the work.

Ethical clearance: Taken

Source of Funding: Nil

Conflict of Interest: Non declared.

Contribution of Author: We declare that this work was done by authors named in this article and all liabilities pertaining to claims relating to content of this article will be done by the authors.

REFERENCES

1. Agnivesha, Charak, Dridhabala. Charaka Samhita, Sutrasthana. 2nd ed. Varanasi: Chaukhamba Sanskrit Pratisthan; 2004. p. 2-12. Vol 2.
2. Select Research Papers on Ayurveda and Siddha Geriatrics, Publisher- Central Council for Research in Ayurveda and Siddha, Dept. of AYUSH, Ministry of Health and Family Welfare Govt. of India, 1998. p. 57
3. Siva K G. Ayurvediya Sharira Kriya Vijnanam. 18th ed. Haridwar: Sri Prakashan; 2001. p. 109. Vol 2.
4. Sharma Pandit H, Kasyapa. Kasyapa Samhita. 3rd ed. Varanasi: Choukhamba Sanskrit Samsthana; 2006. p. 457.
5. Sushruta. Sushruta Samhita Nidan Sthan. 8th ed. Varanasi: Chaukhamba Surbharati Prakashan; 2004. 1(28): p. 458.
6. Madhavakara. Madhav Nidanam. 32nd ed. Varanasi: Chaukhamba Prakashan; 2002. p. 463. Vol 1.
7. Choudhury S.K. Concise Medical Physiology. 2nd ed. Calcutta: New Central Book Agency; 1993. p. 505
8. Das P. C. Text Book of Medicine. 4th ed. Calcutta & Mumbai: Current Book International; 2001. p. 582-583.
9. Sushruta, shastri A.D. Susruta Samhita. 6th ed. Varanasi: Choukhamba Sanskrit Series; 2007. p. 989. Vol 1.
10. Vagbhata, Arundatta, Hemadri. Astanga Hridaya Sutrasthan with the commentary Sarvagasundara and Ayurveda Rasayana. 9th ed. Varanasi: Choukhamba Orientalia; 2002. p. 446-462.
11. Mahajan B K. Methods in Biostatistics for Medical Students and Research Workers. 7th ed. New Delhi: Jaypee Brothers and Medical Publishers; 2009. p. 127-140.
12. <http://www.jmp.com> SAS Institute INC, Cary, NC, USA. 2012. p. 56-58.
13. Vagbhata Briddha, Guptha K A. Astanga Sangraha. 8th ed. Varanasi: Krishnadas Academy. 1993. p. 1001-1003.
14. Reddy K. R C. Bhaisajya Kalpana Vijnanam. 6th ed. Varanasi: Chaukhamba Sanskrit Bhawan; 2001. p. 144-145.
15. Dwarakanatha C. Introduction to Kayachikitsa. 8th ed. Varanasi: Chaukhamba Oriental Publisher; 2000. p. 200.
16. Shamloo M. B, Morteza Nasiri, Aazam Dabirian, Ali Bakhtiyari, Faraz Mojab, Hamid Alvai Maid. The effect of Topical Sessame(Semamum indicum) oil on pain severity and amount of received Non-Steroid Anti-Inflammatory Drugs in Patients with upper or lower extremities trauma. Anesth Pain Med 2015;5(3): p. 1-8.
17. Shah Mayuri. A Comparative study of Matra Basti And Some Indigenous Compound Drug in the management of Sandhigatavata. 2006. p. 25-28.

ORIGINAL PAPER

Pattern of death in unknown bodies at a tertiary healthcare centre

Chikhalkar Bhalchandra G¹, Nadkarni Nitish A², Chavan Gajanan S³, Nanandkar Sudhir D⁴

Received on January 12, 2018; editorial approval on May 10, 2018

ABSTRACT

Introduction: Identity of an individual plays an important role in life as well as death. It becomes a difficult task for even a seasoned forensic expert to establish the identity of the unknown/unclaimed body. **Aims:** The current study was undertaken in order to establish the parameters to study the cause/ manner of death in unknown/ unidentified individuals. **Methods:** Documents like the ADR report, Inquest, Panchnama provided by the police were scrutinized thoroughly. Data was analyzed using MS Excel 2013 software. The reasons which lead to a lapse of judgment on the part of the forensic expert or the investigating officer such as fetuses, mutilated or decomposed bodies, body parts are also analyzed in this study. **Results:** It was observed that out of the 7.6% unknown cases, most cases were in the 31-40 years age bracket, with male predominance seen especially in the month of August. Respiratory illness was the cause of most of the natural deaths, while Head Injury was the leading cause of unnatural deaths. **Conclusions:** We feel a web based interactive tracking application is unequivocally essential to bridge the time gap between the Investigating Officer and the Forensic Expert. In addition, the inter-sectoral co-ordination of medicine and law enforcement agencies may play a crucial role in a smooth functioning of finding the identity of the individual.

Keywords: Forensic Science, Identity, Cause of death, unidentified bodies, Manner of death

INTRODUCTION

Identification is the determination of the individuality of a person based on certain physical characteristics, i.e. exact fixation of personality.¹ It establishes the individuality of a person. Identification data includes the sex, age, external peculiarities such as malformations, scars, tattoo marks, wounds; anthropometric measurements, fingerprints², teeth.³ In depth data can be identified by DNA profiling⁴, bone analysis

and such other methods.^{5,6} Identity should be established in both alive and the dead.⁷ This isn't a complicated process though it is heavily taxing for the meticulous data preservation. But after death, the Investigating Officer or the Forensic Expert may be unable to identify the unknown/unclaimed body because of improper/inadequate history, destruction, burns⁸, decomposition, mutilation of the body.⁹ ¹¹ This warrants forensic experts to consider the scrutiny of such various parameters to confirm the pattern of death.¹² The aspects of geographical surroundings should be taken in consideration while trying to establish the cause of death of such unknown/ unclaimed bodies. In the urban areas, such bodies are not hidden from the human eye and thus brought promptly to the Forensic Expert. However, in rural areas, this may not be the case. The bodies may be left to decompose or may be mutilated by animals.¹³ Such bodies when brought for the forensic evaluation of the cause of death pose a challenge for the experts.

METHODS

A descriptive study was conducted at Grant Government Medical College and Sir J.J. Group of Hospitals, Mumbai for

Address for correspondence:

¹Professor

Mobile: +919969037650

Email: drbgchikhalkar@yahoo.com

²MBBS Student (**Corresponding Author**)

Email: nitishnadkarni369@gmail.com

Mobile: +919920233167

3/15, Santoshi Villa C.H.S. Ltd.

Rajaji Path, Ramnagar, Dombivli (East) – 421201

³Associate Professor

⁴Professor and Head of the Department

Department of Forensic Medicine and Toxicology

Grant Govt. Medical College and Sir J.J. Group of Hospitals, Byculla, Mumbai- 08.

Cite this article as: Chikhalkar Bhalchandra G, Nadkarni Nitish A, Chavan Gajanan S, Nanandkar Sudhir D. Pattern of death in unknown bodies at a tertiary healthcare centre. *Int J Health Res Medico Leg Prae* 2018 July;4(2):66-70. DOI 10.31741/ijhrmlp.v4.i2.2018.16

a study period of 6 months (15th April 2016-15th November 2016).

Sample Size: 55

Inclusion Criteria

1. Cases of unknown/unclaimed bodies brought for post mortem to the Forensic Medicine and Toxicology Department of this hospital during the study period.
2. Unknown/unclaimed persons admitted in the hospital during the study period.

Exclusion Criteria

1. Bodies which were identified later during the autopsy.
2. Deaths certified by the physician in case of known admitted cases.

Before beginning the study, the Institutional Ethics Committee's approval was obtained.

METHOD

In cases brought for post mortem, ADR report, Inquest, Panchnama and other documents provided by the police were scrutinized thoroughly. In case of the admitted patients, hospital records, investigations and autopsy findings were noted.

Cause of the death was studied. Confidentiality was strictly maintained. Bodies brought for autopsy were treated with utmost dignity, findings carefully documented.

STATISTICAL ANALYSIS

The data was calculated using MS Excel 2013 software for the parameters mentioned below. The percentages were calculated and translated into a graphical format.

RESULTS

Out of the 721 bodies brought to the hospital as well as the mortuary in the study period, the number of unidentified cases was 55. Out of the unidentified cases, males comprised of 46 in number, 7 were females and 2 were unknown, owing to the fact that one was a decomposed body and the other was an incomplete skeleton (**Figure 1**).

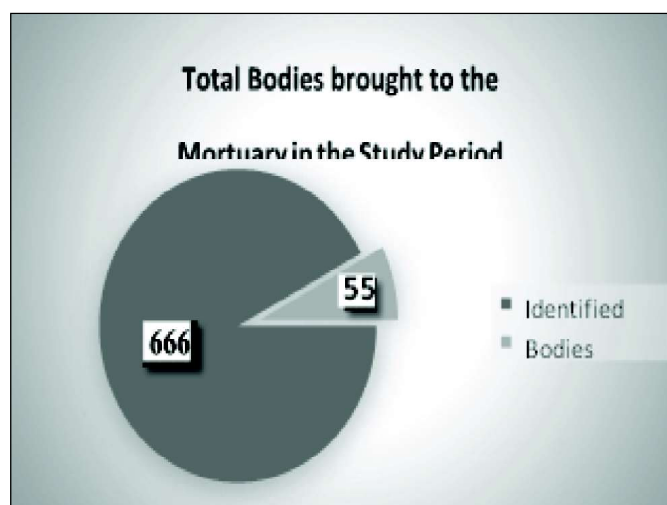


Figure 1 No. of unidentified bodies

The age-wise distribution of the cases was peculiar as described in the figure below. (**Figure 2**).

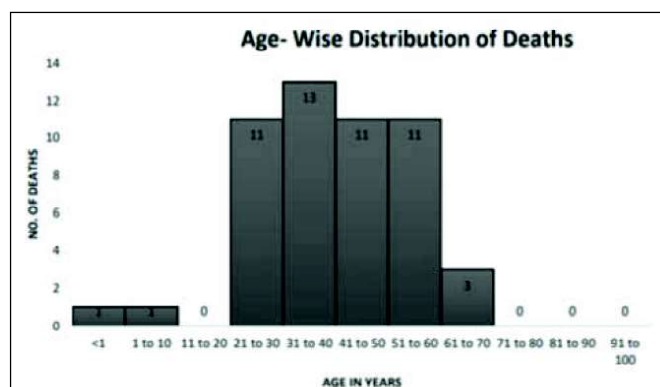


Figure 2 Age-wise Distribution

The temporal characteristics of the study population is shown in the table below. (**Table 1**).

Table 1 Temporal Distribution

Month	% of Cases
April	5
May	20
June	16
July	9
August	25
September	11
October	13

Autopsy was performed in 54 cases while 1 case didn't undergo autopsy, owing to the fact that it was a skeleton. The cause of death was formulated after autopsy. Due to the unavailability of the analysis of the investigations sent to the concerned department at that time, the opinion was reserved in 9 cases. 25 cases died of natural causes. Among them, Pulmonary Tuberculosis was the cause of 20 cases, Hepatobiliary system related deaths were 9 in number. Central Nervous System causes contributed to 7 cases, Cardiovascular system damage contributed in 4 cases; Kidney related causes in 2 cases. It has to be noted here that multisystem failure is witnessed and the causes may overlap (**Figure 3**).

Unnatural deaths formed 36% of all the cases out of which Head Injury alone was a cause of 11 deaths while the head injury was coupled with Bone Fracture, polytrauma, burns can be seen. One death was caused by a road-traffic accident while cut-throat injury and drowning contributed to one death (**Figure 4**).

The bodies were analyzed after the autopsy and a thorough examination of the system suspected in the cause of the death was carried out. Efforts were made by the forensic experts to establish the identity of the individual. In order to do that, Fingerprints of all the ten fingers of the hand were taken for

53 cases as of the remaining 2, one was decomposed and one was a skeleton. Blood samples were collected from 53 cases as well. DNA was collected from 50% of the cases, as an aide for establishment of the unique identity of the individual. The viscera were collected and preserved in 22% of the cases as were sent for histopathological and chemical analysis. Bone and tooth samples were also acquired for additional investigation in certain cases (Figure 5).

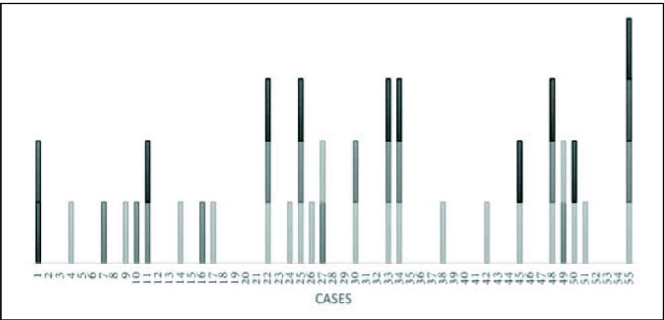


Figure 3 Systems Involved in Natural Deaths

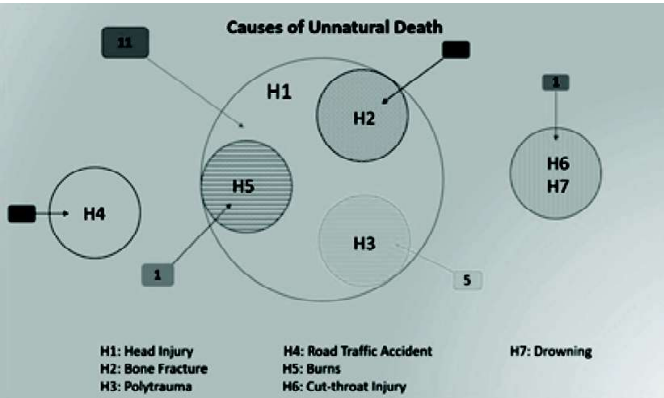


Figure 4 Causes of Unnatural Death

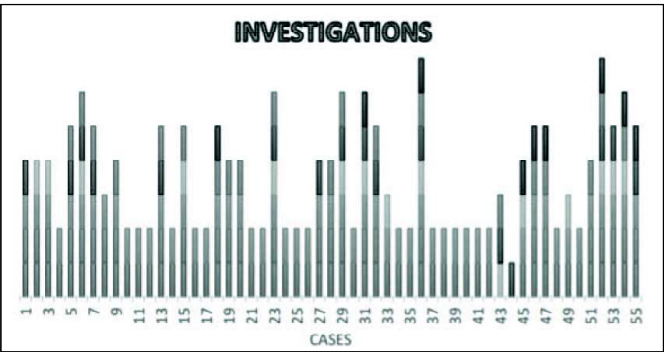


Figure 5 Investigations done to establish the identity

It was found out that 32% bodies were brought from the rural areas while 51% bodies were brought from urban areas, giving a faint idea about the predisposing socio-economic factors of the individuals. However, no data was found regarding 17% of the cases. None of the unknown/unclaimed bodies which were brought had their deaths certified. 60% of cases were admitted to the hospital while 40% of the cases were brought dead.

Out of the 33 cases previously admitted autopsy was

performed in less than one day in 96% cases while in 4% cases, autopsy was carried out after 24 hours. Out of the 22 cases brought dead, Inquest was carried out as described in the table below. (Table 2).

Table 2 Analysis of the time taken for carrying out the Inquest in brought dead bodies

Percentage of the Cases which were brought dead	Time taken for carrying out the Inquest (Panchnama) after the acquisition of the body
20%	24-36 hrs
38%	36-48 hrs
32%	48-72 hrs
10%	>72 hrs

DISCUSSION

The aim of this study was to study the pattern of unknown/unclaimed bodies with accuracy and reliability. The present study shows the various parameters required for assessing the pattern.

It is with great difficulty and a sense of responsibility that an autopsy surgeon has to deal with the unidentified bodies' autopsies. Unidentified bodies formed just 7.6% of the total deaths registered during the study period at the study centre. This may look like a small figure, but the amount of professional experience that the forensic expert has to put in it is taxing. When extrapolated on a large scale, it puts a great stress on the resources of the nation. It is mentioned that almost all the cases that were brought dead had their Inquest (Panchanama) done after 24 hours. The reason is the delay between the written communication of the police station/ authority in the area where the body was found and the tertiary health care centre where the body was brought for autopsy. However, communication via telephone was carried out in such cases. Maximum number of deaths (24%) occurred in the age group of 31-40, the very pillars of the development of the society. Similar results were recorded in a study conducted at Kolkata.¹⁴ Also, 51% of the cases brought were from the urban areas, portraying the socio-economic imbalance even in the urban setting.

The gender distribution of the unknown bodies is skewed. 84% of the bodies consisted of the male cohort. This pattern is similar to the pattern observed in a study made in Chandigarh.¹⁵ 25% cases were registered in the month of August, suggesting an unsymmetrical autopsy load. Tuberculous Meningitis was the cause of death in most 36% of the cases followed by Head Injury in 32.7% of the recorded cases. Similar results were recorded in a study conducted at Chandigarh.¹⁵ The cause of death was registered as natural and unnatural. Analysis of the morbidities associated with the natural deaths from a community medicine perspective give us a rough idea of the low socio-economic strata of the cases. Unnatural deaths may have several factors

involved, like vehicular or rail accidents, drowning, burns, poisoning, violent fights, body run over by cars or trains, etc.^{8,16-23} These cases often involve the beggars or the destitute of the streets. The personal belongings of the bodies play an essential role in establishing the identity. It can be of help even in cases where long-distance relatives establish the identity of the individual after a long time. Thus, the data collected by the forensic expert was a cumulative effort of the autopsy and the belongings as well as the visible identification data.

Investigations are the pillars of the identification process. 96.3% of the cases had their fingerprints of all the ten fingers of the hand as well as the blood samples taken. Viscera were acquired from 22% of the cases. The samples were sent for histopathological and chemical analysis.

The autopsy fulfils the demands to answer the questions which form the aims and objectives of the study. The cause of death, age-distribution, gender distribution, temporal distribution should be studied by examination and assessment of the individual during the autopsy and the reports of the samples sent for histopathological and chemical analysis should be assessed. Thus, this duty is in the hands of the forensic expert, Investigating Officers, Biochemistry and Pathology Faculty of the institution. The Autopsy Protocol was followed.²⁴

Shortfalls of the study include possible observer bias, arising from the inter-observer variation between different autopsy experts analyzing bodies over the period of the study.²⁵ Methods such as proforma for data collection were undertaken so as to ensure uniformity. Further, sample size could be expanded by undertaking the study over longer periods of time. Ultimately, the study undertaken provides a useful baseline for enthusiastic researchers to conduct further surveys into the pattern of death in unknown/ unclaimed bodies including inferential studies designed to predict the number of unknown/unclaimed bodies arising out of a particular social strata.

CONCLUSION

The present study has established the pattern of death in unknown/ unclaimed bodies brought at the tertiary health centre in Mumbai region in the 6 month study period. Most of the cases were in the month of August. Male predominance is seen in the cases. Respiratory disorders were the cause of most of the natural deaths while Head Injury contributed to most of the unnatural deaths. The technical formalities are the cause of the delay which can be mitigated by a web-based interactive tracking application of the unknown/ unclaimed bodies by various agencies as well as an intersectoral co-ordination between the law enforcement agencies and the Forensic Medicine Department.

Newer techniques for the autopsy, preservation of the viscera, bone dating to find the time since death, a dedicated section in the Microbiology department for the bacteriological analysis of the specimens should be set up and DNA of each and every specimen should be collected so that the identification

is confirmed even after the destruction of the body. A visual record of the autopsy should be documented for future reference. This can be done by photography of the autopsy.

Acknowledgements: We owe our sincere gratitude to the staff of the Department of the Forensic Medicine and Toxicology for their support. The authors express their sincere thanks to Mr. Kuber Bhinde and Mr. Amogh Nadkarni for their support and assistance in conducting this study.

Conflict of Interest: None declared.

Ethical Clearance: Institutional Ethical Committee clearance was obtained before beginning the study.

Source of Funding: Self- funded.

Contribution of Authors: We declare that this work was done by the authors named in the article and all liabilities pertaining to the claims relating to the content of this article will be borne by the authors. Conception of Idea, Aims and Objectives of the Study, Discussion of the Results, Collection of Data and attending the autopsies, Graphical Representation of the Data, Statistical Analysis of the Data – Nitish Nadkarni. Supervision of Data Collection – Dr. B. G. Chikhalkar, Dr. G. S. Chavan.

REFERENCES

1. Reddy KSN. The essentials of forensic medicine and toxicology. 33rd ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2014. p.57.
2. Kaushal N, Kaushal P. Human identification and fingerprints: A review. J Biomet Biostat 2011;2:123.
3. Valenzuela A, Martin-de las Heras ST, Marques NE, Bohoyo JM. The application of dental methods of identification to human burn victims in a mass disaster. Int J Legal Med 2000;113:236–239.
4. Budowle B, Bieber FR, Eisenberg AJ. Forensic aspects of mass disasters: strategic considerations for DNA-based human identification. Legal Medicine 2005;7:230–243.
5. Jayaprakash PT, Singh B, Yusop RAAM, Asmuni HS. Skull-photo superimposition: a remedy to the problem of unidentified in Malaysia. Malaysian J Forensic Sci 2010;1(1):34–41.
6. Riepert T, Ulmcke D, Schweden F, Nafe B. Identification of unknown dead bodies by the skull using the X-ray simulation program FoXSIS. Forensic Sci Int 2001;117(1-2):89–98.
7. Vij K. Textbook of forensic medicine and toxicology principles and practice. 5th ed. Elsevier; 2011. p.35–7.
8. Harish D, Kumar A, Sharma B R. Burns Septicemia: The Leading Cause of Burn Mortality. J Punjab Acad Forensic Med Toxicol 2008;8(2):10–16.
9. Smith EL. Scientific identification of deceased prevents misidentification. Forensic Science suite [serial online] 2011 May [cited 2018 Jun 01];1(1): Available from: URL: 101http://erikalynsmith.suite101.com/scientific-

- identification-of-deceased-prevents-misidentification-a360528
10. Hanzlick R, Clark S. The unidentified decedent reporting system. *Am J For Med Pathol* 2008;29(2):106-13.
11. Job C. Determination of cause of death in decomposed bodies – a regional study. *JIAFM* 2009;31(1):11-17.
12. Balloch J. Identifying the unknown dead: new system cross-checks missing person cases with unidentified bodies. *Knoxville News Sentinel* 2012 Jan 15; [cited 2018 June 01]; Available from: URL: <http://m.knoxnews.com/news/2012/jan/15/identifying-the-unknown-dead-new-system-that-to>
13. Kumar A, Tyagi A, Aggarwal N K. Sex determination by morphology of talus bone. *J Forensic Med Toxicol* 2008; 25(1):50-3.
14. Chattopadhyay S, Shee B, Sukul B. Unidentified bodies in autopsy – A disaster in disguise. *Egypt J Forensic Sci* 2013;3(4):112-5.
15. Kumar A, Chavali KH, Harish D, Singh A. Pattern of cause of death in unknown dead bodies: a one year prospective study. *J Punjab Acad Forensic Med Toxicol* 2012;12(2):92-5.
16. Job C. Determination of cause of death in decomposed bodies – a regional study. *J Ind Forensic Sci* 2009;31(1):11-7.
17. Kanchan T, Krishan K, Sharma A, Menezes RG. A study of correlation of hand and foot dimensions for personal identification in mass disasters. *Forensic Sci Int* 2010 Jun 15;199(1-3):1-6.
18. Ludes B, Tracqui A, Pfitzner H, Kintz P, Levy P, Disteldorf M, et al. Medicolegal investigations of the Airbus A 320 crash upon Mount Ste-Odile, France. *JFS* 1994;39(5):1147-52.
19. Hanzlick R, Smith GP. Identification of the unidentified deceased. *Am J For Med Pathol* 2006;27(1):79-84.
20. Sharma B R, Harish D, Sharma V, Vij K. Poisoning in Northern India: Changing Trends, Causes and Prevention Thereof. *Med Sci Law* 2002;42(3):251-7.
21. Sharma BR, Harish D, Sharma V, Vij K. Road Traffic Accidents – A Demographic and Topographic Analysis. *Med Sci Law* 2001;41(3):266-74.
22. Chavali K H, Sharma B R, Harish D, Sharma A, Sharma S, Singh H. Head injury, the principal killer in road traffic accidents. *J Ind Acad Forensic Med* 2006; 28(4):121-4.
23. Singh A, Gorea RK. Safe designing of vehicles from pattern of fatal road traffic accident. *Proceedings of the International Conference on Advances in Mechanical Engineering*; 2006; Fatehgarh Sahib, Punjab, India: 2006.
24. Murty Om. Uniform guidelines for postmortem work in India. *J Forensic Med Toxicol* 2013;30:1-137.
25. Park K. Textbook of Preventive and Social Medicine. 22nd ed. Jabalpur: Banarsidas Bhanot Publishers; 2013. p. 130.

ORIGINAL PAPER

Open cholecystectomy versus laparoscopic cholecystectomy: a comparative study

Kumar PC¹, Naseem Fraz²

Received on January 12, 2018; editorial approval on June 18, 2018

ABSTRACT

Introduction: A gall bladder helps in fluid transport and its regulation. **Objectives:** The purpose of present study was to evaluate the safety and efficacy of laparoscopic cholecystectomy in comparison with open cholecystectomy. **Material and methods:** The present study comprised of 200 patients who underwent open and laparoscopic cholecystectomy. **Result:** The age and sex distribution of the whole series corresponds fairly well with the usual age and sex affection of gallbladder disease. Overall there was a female preponderance and the peak age group affected was 3rd and 4th decades. Most of the males affected were in the 4th and 5th decades of life. The most common indication for cholecystectomy was cholelithiasis followed by acutecalculous cholecystitis. Three cases were converted from laparoscopic to open cholecystectomy one due uncontrolled bleeding and two due to a large calculus in the cystic duct that could not be extracted. The mean operative time in laparoscopic group was 61.7 min compared to 108.1 min in open cholecystectomy groups. Laparoscopic group has intraoperative complications like minor bleedings, gall stone spillage and major bleeding in one case. There was no bile duct injury in laparoscopy group. Major complications like bile duct injury seen in only two cases of open cholecystectomy in our study, and liver bed bleeding and gall stone spillage. Open group had more complications like wound infections, chest infections. No mortality was seen in our study in both groups. **Conclusion:** The patients in the laparoscopic group had less pain, started oral intake earlier and were discharged earlier compared to open group. They were also able to resume their normal work sooner.

Keywords: Intra operative complication, mortality, gallbladder disease

INTRODUCTION

Benign diseases of the biliary tract are one of the most

common surgical problems in the world. Gallstones especially, affect millions.¹ Surgery plays an important part in the treatment and over half a million cholecystectomies are performed worldwide.² Cholecystectomy has been the universal standard for the treatment of symptomatic cholelithiasis.³ The first open cholecystectomy was performed in 1882. Since its introduction in France, laparoscopic cholecystectomy has become the treatment of choice for symptomatic cholelithiasis.³ In developing countries like ours, where the medical cost and loss of working days is a major issue, whether laparoscopic cholecystectomy would be a cost-effective alternative to open cholecystectomy is an issue to be considered.

Pathophysiology: Studies have demonstrated that the gall bladder concentrates hepatic bile by selective re-absorption of bile constituents. Sodium and chloride ion are absorbed from the gall bladder ion by both active and transport mechanism; water absorption is thought to be passive and the secretion of the water and the electrolyte by the gall bladder mucosa is an active process which can take place against hydrostatic and osmotic gradients.⁴ The net water transport across the gall bladder may be influenced by both humoral and autonomic nerves. The flow of bile into the gallbladder is modulated by hepatic secretory pressure, sphincter of Oddi and cystic duct resistance.

Acute cholecystitis: Acute cholecystitis is clinically defined as an episode of acute biliary pain accompanied fever and right hypochondrial tenderness and guarding, with persistence of the symptoms beyond 24 hours. It is usually due to

Address for correspondence:

¹Associate Professor (Corresponding Author)

Email: drpulinkr@gmail.com

Mobile: +919864032323

²Registrar

Dept. of Surgery

Gauhati Medical College and Hospital, Guwahati, Assam

Cite this article as: Kumar PC, Naseem Fraz. Open Cholecystectomy Versus Laparoscopic Cholecystectomy: A Comparative Study. Int J Health Res Medico Leg Prae 2018 July;4(2):71-75. DOI 10.31741/ijhrmlp.v4.i2.2018.17

persistent impaction of a stone in the neck of the gallbladder.⁵

Acute acalculous cholecystitis: Acute acalculous cholecystitis is found in approximately 5% of all patients undergoing cholecystectomy. It predominantly affects individuals with other conditions including trauma, non-biliary surgical procedures, sepsis, burns, TPN, mechanical ventilation, blood transfusions and use of narcotics or antibiotics.

Acute emphysematous cholecystitis: An uncommon variant characterized by the production of gas by the infecting bacterial organism. It occurs mostly in men between 50-60 years of age and in diabetics.⁵

Chronic cholecystitis: Chronic cholecystitis develops as a result of recurrent attacks of mild acute cholecystitis. The pathological changes, which often do not correlate well with symptoms, vary from those of an apparently normal gallbladder with minor chronic inflammation in the mucosa to a shrunken organ with gross transmural fibrosis and organized adhesions. The mucosa is initially hypertrophied but later become atrophied.⁵

METHODS

The subject of this study consists of 200 patients who have undergone gallbladder removal, in Guwahati Medical College and Hospital. 100 patients who have undergone laparoscopic cholecystectomy and 100 patients who have undergone open cholecystectomy from August 2014 to August 2015 have been taken into the study.

Inclusion Criteria: All patients with acute cholecystitis, chronic cholecystitis, cholelithiasis, empyema, and mucocoele of gallbladder.

Exclusion Criteria: Patients with choledocholithiasis, carcinoma of gallbladder, perforated gallbladder, gangrenous gallbladder has been excluded from the study.

All the patients were admitted and a detailed history and clinical examination was carried out as per written proforma. The choice of operation in each case is decided by patient's choice by explaining both procedures and also preference of the surgeon in each case. Patient's history was assessed with special reference to pain, fever, nausea, vomiting, dyspepsia, jaundice, mass per abdomen, weight loss and decreased appetite. A careful emphasis was made to record the physical findings particularly icterus, tenderness in right hypochondrium and gallbladder mass. Laboratory testing and USG of gallbladder and CBD was done. CBD stone was ruled out by USG.

Method of Collection of Data: Operative steps, duration, intra and postoperative complication were noted in detail and tabulated.

Post-operative assessment with respect to post operation hospital stay, complication including post-operative pain.

Conversion rate: cases that had encountered difficulty during laparoscopic cholecystectomy were converted to open but were included into laparoscopic group.

Chi-square Test

$$\chi^2 = \frac{\sum (O_i - E_i)^2}{E_i}, \text{ where } O_i \text{ is observed frequency and } E_i \text{ is expected frequency}$$

Fisher Exact Test

	Class 1	Class 2	Total
Sample 1	a	b	a + b
Sample 2	c	d	c + d
Total	a + c	b + d	n

$$\text{Fisher Exact Test statistic} = \frac{n!}{a!b!c!d!} p^{a+b} (1-p)^{c+d}$$

$$\text{Student t test} = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{s^2 (1/n_1 + 1/n_2)}}$$

Statistical software: The statistical software namely SPSS 11.0 and Systat 8.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS

Age wise distribution is shown in **Table 1**.

Table 1 Age distribution of patients studied

Age_group	Lap		Open		Total	
<= 20	10	10.00%	8	8.00%	18	9.00%
21-30	30	30.00%	28	28.00%	58	29.00%
31-40	29	29.00%	26	26.00%	55	27.50%
41-50	18	18.00%	22	22.00%	40	20.00%
51-60	9	9.00%	14	14.00%	23	11.50%
61-70	4	4.00%	2	2.00%	6	3.00%
Total	100	100.00%	100	100.00%	200	100.00%
Mean	35.85 ± 12.73		37.58 ± 13.01		36.715 ± 12.87	

$$P = 0.76$$

Sex distribution among the cases are shown in **Figure 1**.

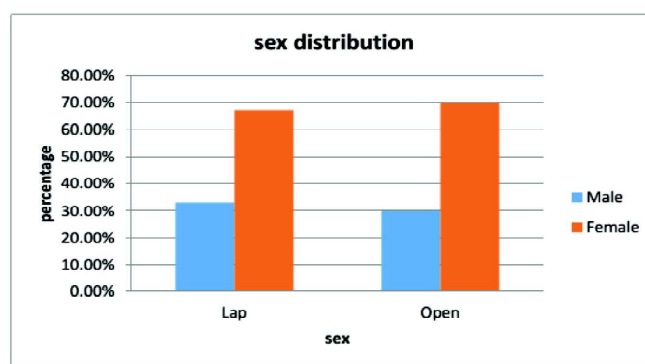


Figure 1 Sex distribution among the cases

Incidence of Cholelithiasis is more in female population so the operative ratio is more in females.

Statistical Methods: Chi-square and Fisher Exact test has been used to find the significance of proportion of age, sex, indications, complications, post-op pain, and patients' satisfaction between the two groups. Student t-test has been

used to find the significance of resumption of oral intake, duration of surgery, number of days of stay in hospital, return to normal work in days between the two groups.

Table 2 Gender Distribution in different age groups

Age_group	Lap						Open					
	Male		Female		Total		Male		Female		Total	
< = 20	3	9.10%	7	10.40%	10	10.00%	2	6.70%	6	8.60%	8	8.00%
21-30	7	21.20%	23	34.30%	30	30.00%	5	16.70%	23	32.90%	28	28.00%
31-40	8	24.20%	21	31.30%	29	29.00%	4	13.30%	22	31.40%	26	26.00%
41-50	8	24.20%	10	14.90%	18	18.00%	10	33.30%	12	17.10%	22	22.00%
51-60	6	18.20%	3	4.50%	9	9.00%	8	26.70%	6	8.60%	14	14.00%
61-70	1	3.00%	3	4.50%	4	4.00%	1	3.30%	1	1.40%	2	2.00%
Total	33	100.00%	67	100.00%	100	100.00%	30	100.00%	70	100.00%	100	100.00%
Mean	39.33 ± 12.63		34.13 ± 12.52		35.85 ± 12.73		43.63 ± 14.2		34.99 ± 11.63		37.58 ± 13.01	
P =	0.187						0.029					

There was a preponderance of cases in the 2nd, 3rd and 4th decades of life in both groups accounting for nearly 72.5% of the cases. The mean age of patients in both groups was around 35 years. There was a female preponderance in both groups with 67% of patients being female in Group LAP and 70% patients being female in group OPEN (Table 2).

The most common indication for open cholecystectomy was symptomatic cholelithiasis (91.5%). In the laparoscopic group also symptomatic cholelithiasis (90%) was the most common cause (Table 3).

Table 3 Indication for Cholecystectomy

Diagnosis	Lap		Open		Total	
Symptomatic Cholelithiasis	90	90.00%	93	93.00%	183	91.50%
Acute Cholelithiasis	10	10.00%	7	7.00%	17	8.50%
Total	100	100.00%	100	100.00%	200	100.00%
P =	0.447					

The duration of procedure in laparoscopic group is counted from insertion of Veress needle to the port site suturing and in open cholecystectomy group from skin incision to skin suturing. The duration of procedure ranged from 60-90 min

Table 4 Intra operative complications

Intraop-Complications	Lap		Open		Total	
None	92	92.00%	85	85.00%	177	88.50%
Cbd injury	0	0.00%	2	2.00%	2	1.00%
Gall stone spillage	4	4.00%	3	3.00%	7	3.50%
Liver bed bleeding	0	0.00%	5	5.00%	5	2.50%
Major bleeding	1	1.00%	1	1.00%	2	1.00%
Minor bleeding	3	3.00%	4	4.00%	7	3.50%
Total	100	100.00%	100	100.00%	200	100.00%
P =	0.182					

in lap group and 90-120 min in open group with statistical significance ($p < 0.05$). The total duration of the surgery includes both anaesthetic time and operative time.

Intra-operative complication is low in laparoscopic group but not statistically significant as

$p = 0.182$ (Table 4). Post-operative complications are statistically more associated with Group open with $p = 0.004$ (Table 5).

Table 5 Post-Operative Complications

Post-op-Complications	Lap		Open		Total	
None	94	94.00%	78	78.00%	172	86.50%
Chest Infection	2	2.00%	10	10.00%	12	6.00%
Wound Infection	4	4.00%	12	12.00%	16	8.00%
Total	100	100.00%	100	100.00%	200	100.00%
P =	0.004					

Drain output is significantly low in laparoscopic cholecystectomy as shown in Table 6.

Table 6 Comparison of Drain Output

Drain (ml)	Lap		Open		Total	
0	80	80.00%	47	47.00%	127	63.50%
< 25	7	7.00%	20	20.00%	27	13.50%
< 50	7	7.00%	18	18.00%	25	12.50%
< 100	5	5.00%	14	14.00%	19	9.50%
< 200	1	1.00%	1	1.00%	2	1.00%
Total	100	100.00%	100	100.00%	200	100.00%
P =	0.00001					

Mean pain is significantly less in Group LAP with $p = < 0.001$. More than 50% of the patient in open cholecystectomy group had moderate to severe pain whereas most of patient in laparoscopycholecystectomy has mild pain.

Post-operative mobilization is significantly earlier in Group LAP with $p < 0.001$. Post-operative mobilization is significantly earlier in lap group (26 hrs) compared to open group (46hrs).

Duration to mean post-operative oral feeds is significantly less in Group LAP when compared to group Open with $p < 0.0001$. Resumption of oral intake was significantly earlier in group LAP (17.64hrs) when compared to group Open (24.18 hr).

Duration of hospital stay is significantly less in Group LAP compared to Group open with $p < 0.0001$. The total duration of hospital stay was shorter in group A (mean 2.43 days) compared to patients in group B (mean 6.32 days).

Mean return to work is significantly less in Group LAP with $p = < 0.0001$. Return to work is calculated from the day of surgery. Patients in the lap group returned to work earlier (6.95 days) when compared to open group (14.7 days).

Mean patient satisfaction score is significantly less in Group open with $p < 0.0001$. Significant number of patients responded with good to excellent grading (>75%) when compared to those patients in group B (14%) as shown in **Table 7**.

Table 7 Patient Satisfaction

Patient Satisfaction	Lap		Open		Total	
Poor	5	5.00%	26	26.00%	31	15.50%
Average	10	10.00%	60	60.00%	70	35.00%
Good	55	55.00%	13	13.00%	68	34.00%
Excellent	30	30.00%	1	1.00%	31	15.50%
Total	100	100.00%	100	100.00%	200	100.00%

P = 0.0001

DISCUSSION

Cholelithiasis is a common disease entity. Frequent occurrence and serious complications of cholelithiasis have made this one of the most important surgically correctable diseases. Laparoscopic cholecystectomy has significantly changed the treatment of gallstone disease.

This was a comparative clinical study consisting of 200 patients undergoing cholecystectomy conducted in our institute, Guwahati Medical College and Hospital from August 2014 to August 2015.

The patients were randomized into two groups: 100 patients in Group LAP (laparoscopic cholecystectomy) and 100 patients in Group OPEN (open cholecystectomy). The study was undertaken to compare the efficacy, safety and patient's satisfaction between the two procedures.

The main sufferers of gallbladder disease in our study were females as compared to males. Out of total 200 cases, 63 cases were males, and 137 females, which are very much similar to those observed by Fraz and others⁶ and U. Berggren and others⁷.

No age is said to be immune to gallbladder disease, however they were more common in the 3rd, 4th and 5th decades of life as 72% of the cases belonged to these decades. Workers like Thomas B Hugh et al⁸ R Schmitz et al⁹ have reported a similar peak incidence in the 4th and 5th decade. In this study also, average age group affected were 3rd and 4th decade and the mean age group of this study was 36 years. The duration of surgery

was lesser in the LAP group at 60 – 90 mins compared with 90 – 120 minutes in OPEN group in this study. Other studies quoted Soper et al¹⁰ with 95 minutes for laparoscopic and 122 min for open. The duration of surgery is lesser in the LAP group when compared to the OPEN group for the following reasons: 1.) Ease of access. 2.) Better visualization 3.) Minimal anaesthetic time.

The overall rates of complications were more in the OPEN group. The most common complications found were wound and chest infection (seen almost exclusively in open group). Other complications like bile duct injury, major bleeding requiring conversion to open cholecystectomy, visceral injury was not encountered probably due to improved visualization afforded by the laparoscope thereby facilitating better delineation of normal anatomy and also early detection of aberrant anatomy. There was no mortality in this study.

Patients undergoing laparoscopic cholecystectomy had less pain (mild to moderate) when compared to those undergoing open cholecystectomy (moderate to severe). In this study open cholecystectomy group having severe pain (46%), moderate pain (39%), mild pain (15%). Laparoscopic Cholecystectomy group having severe pain (3%), moderate pain (15%), mild pain. In a similar study conducted by Hieronymus PJD et al¹¹ similar findings were seen. Most of the patients in the laparoscopic group were able to take orally within the first 18- 24 hours whereas the oral intake of most patients in the open group was possible only after 24 - 36 hours. In the present study average interval of oral intake was in open group (24.8hr), LAP group (17.6). The total period of hospital stay in our study was around 2 days for the LAP group and around 7 days in the open group. The mean time for return to normal work after surgery in the present study was 7 days in the laparoscopic group and 14 days in the open group. Studies by Jeffrey S Barkun¹², Ahmed Assalea¹³, and AW Majeed et al¹⁴ also showed a much shorter stay in both groups a postoperative hospital stay of 1.8 days (which is similar to that seen in our study) & 3-5 days in the open group which is slightly lesser than our study.

Only three cases were converted into open surgery making it comparable with the conversion rate in other studies. Two were converted due to large cystic duct stone, one was converted due to the uncontrolled bleeding. Patients in the lap group in comparison to the open group were allowed early oral feeds, were mobilized early, returned to work earlier, experienced less pain and better comesis. Consequently, most of the patients gave excellent to good rating when compared to open group who gave good to average rating, as most of them experienced more pain, were in the hospital for longer duration. Most of the patients in the open group were more dissatisfied with the large scar associated with the surgery.

CONCLUSION

The results support the view that laparoscopic cholecystectomy is a safe and justified replacement for open cholecystectomy with less postoperative morbidity associated with faster patient recovery and satisfaction as documented

by less postoperative pain, less duration of analgesic requirement, earlier resumption of oral feeds, earlier full mobilization and discharge, as well as early return to work.

In conclusion, the study supports the view that laparoscopic cholecystectomy is safer and efficacious and offers definitive advantages over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy. Laparoscopic cholecystectomy can be considered the gold standard against which other procedures have to be compared.

Conflict of interest: No conflict of interest associated with this work.

Ethical issues: Ethical clearance was sought from the institutional ethics committee.

Source of funding: None.

Author's contribution: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Russell RCG, Norman S. William, Christopher K, Bullstrode. Bailey and Love short practice of surgery. 24th ed. Arnold International; 2003. p. 1103.
2. Courtney M. Townsend, Daniel Beauchamp R, Mark Evers B, Kenneth L. Mattox. Sabiston Textbook of Surgery. 18th ed. Elsevier; p. 1612.
3. Seymour I. Schwartz, Tom G. Frank C. Spencer, John M. Daly, Joseph Fischer, Aubrey F. Galaway. Principles of surgery. Mc Graw Hill; 2000. vol. 2 p. 1437-1465.
4. Takahashi. "Comparison of the gall bladder contraction induced by motilin and cholecystokinin in dogs". Gastroenterology, 1982; 82: 419-424.
5. Shield Sherlock, James Dooley. Disease of liver and biliary system. 9th ed. Blackwell Scientific Publication; 1991. p. 63.
6. Richard DC Frazee, John W. Roberts, Gyman C. Okeson, Richard E. Symonds, Samuel K. Synder, John C. Hendricks et al. Open versus laparoscopic cholecystectomy: A comparison of postoperative pulmonary function. Ann Surg 1991 June; 651-653.
7. Berggren U, Gordh T, Grama D, Haglund U, Rastad J, Arvidsson D. Laparoscopic versus open cholecystectomy: Hospitalization, sick leave, analgesia and trauma responses. Br J Surg 1994; 81: 1362-65.
8. Thomas B. Hugh, Frank C. Chen, Thomas J. Hugh, Bei LI. Laparoscopic cholecystectomy. Medical Journal of Australia 1992 March; 156: 318-319.
9. Schmitz R, Rohde V, Treckmann, Shah S. Randomized clinical trial of conventional versus mini cholecystectomy. Br J Surg 1997; 84: 1683-1686.
10. Nathaniel J. Soper, Jeffrey A. Barteau, Ralph V. Clayman, Stanley W. Ashley, Deanna L. Dunnegan. Comparison of early postoperative results for laparoscopic versus standard open cholecystectomy. Gynecol Obstet 1992 Feb; 174: 114-116.
11. Hieronymos PJD, Stevens, Marjan Van De Berg, Coert H. Russeler, Jack C. J. Wereidsma. Clinical and financial aspects of cholecystectomy: Laparoscopic versus open technique. World J Surg 1997; 21: 91-97.
12. Jeffrey S. Barkun, Alan N. Barkun, Jonathan Meakins. Laparoscopic versus open cholecystectomy: The Canadian Experience. Am J Surg 1993 April; 165: 455-458.
13. Ahmad Assalia, Mosh E. Schein, Doron Kopelman, Moshe Hashmonai. Mini cholecystectomy versus conventional cholecystectomy: A prospective randomized trial— implications in laparoscopic era. World J Surg 1993 Nov-Dec; 17: 755-75.
14. Majeed AW, Troy G, Nicholl JP, Smythe A, Reed MWR, Stoddard LJ et al. Randomized prospective single blind comparison of laparoscopic versus small incision cholecystectomy. Lancet 1996 April 13; 347: 989-991.

ORIGINAL PAPER

Adult community acquired pneumonia in a tertiary care teaching hospital of Assam: a hospital based study

Kalita Deepjyoti¹, Deka Sangeeta², Hazarika NK³

Received on May 31st, 2018; editorial approval on June 12, 2018

ABSTRACT

Introduction: Adult Community-acquired pneumonia(CAP) is a common problem-afflicting world over. Delay in isolation of pathogens, emergence of newer agent and rapidly evolving drug resistance globally are making the effective management of CAP, especially in developing countries, very challenging. Empirical therapy, based on knowledge of local pathogen profile and drug resistance pattern is the mainstay. This study was a preliminary work in local CAP subjects. Aim: To profile a pathogen list as well as to study the pattern of resistance in important pathogens. **Methods:** Semi quantitative culture method was employed on sputum sample followed by drug sensitivity testing based on disc diffusion technique. Biphasic PPLO media was employed with a view to isolate Mycoplasma pneumoniae as well. Epidemiological data were analysed in the backdrop of lab data generated. **Results:** Adult CAP was found to be more common in middle-aged to elderly male with *Streptococcus pneumoniae* and *Klebsiella pneumoniae* being the major pathogens followed by other common. There were no *Haemophilus influenzae* isolate. Penicillin resistance in *Pneumococci* was high and drug resistance in other agents were found to be of moderate to high level. **Conclusion :** Drug resistance is a menace and it needs to be contained urgently. A larger study with more intensive experimental component is the need of the hour.

Keywords: CAP, Adult CAP, Drug resistance, DRSP, Respiratory pathogens, LRTI, Community-acquired LRTI, Mycoplasma culture

INTRODUCTION

Despite considerable improvement and extensive use of variety of diagnostic tests, responsible pathogens remain uncertain in as many as 50% of Community-acquired pneumonia (CAP) cases.^{1,2} Even in identifiable cases, few days are consumed before identification of agents from sputum or blood samples. Due to this uncertainty the antibiotic

treatment for CAP empirically relies on epidemiological data on causative pathogens in a particular geographic area.³ Also the relative frequency of aetiological agents varies among different geographical area.⁴ Thus it is crucial and necessary that large tertiary care centres determine the peculiar microbial pattern prevalent in their own CAP patients.⁴

Common identifiable isolates of CAP can vary with factors like geographical locations, age of the patients, clinical profile of the patients, co-morbid conditions etc. Frequently isolated agents include *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Staphylococcus aureus*, *Moraxella catarrhalis*, *Pseudomonas*, Gram-negative-enteric bacilli (GNEB) like *Klebsiella*, *E coli* etc, atypical agents like *Mycoplasma pneumoniae* etc.¹

Emergence of high rates of antimicrobial resistance has complicated the empiric management of CAP patients. Drug Resistance *S. pneumoniae* (DRSP) has been the focus of numerous recent studies, due to its high virulence and extraordinary rise in antibiotic resistance level in relatively short period.¹

Some studies carried out in India indicate existence and increasing threat of drug resistant strains of pneumococci, especially in respiratory tract infections.^{5,6} Unfortunately, to the best of our knowledge, so far there is no published study on CAP or CAP associated DRSP or other drug resistance

Address for correspondence:

¹Associate Professor of Microbiology
AIIMS Rishikesh
Mobile: 7351962771

Email: deep.micro@aiimsrishikesh.edu.in

²Assistant Professor of Microbiology (Corresponding Author)
F. A. A. Medical College, Barpeta
Email: drsangeeta2009@gmail.com
Mobile: 9864606609

³Prof (Rtd) & Head, Microbiology, Gauhati Medical College

Cite this article as: Kalita Deepjyoti, Deka Sangeeta, Hazarika NK. Adult community-acquired pneumonia in a tertiary care teaching hospital of Assam: a hospital based study. *Int J Health Res Medico Leg Prae* 2018 July;4(2):76-80. DOI 10.31741/ijhrmlp.v4.i2.2018.18

from North Eastern part of India.

Objective

Identification of common agents of our CAP subjects and to study the pattern of drug resistant isolates.

METHODS

About 94 clinically and/or radiologically diagnosed (as per definition of ATS) subjects of CAP visiting Gauhati Medical College during October 2005 to September 2006 were included in this study.¹ Inclusion criteria were - age >15 years, New/progressive pulmonary infiltrate on a chest X-ray plus finding of at least one of the major criteria (cough/sputum production/temperature > 37.8°C) or, at least 2 of the minor criteria (pleuritic chest pain/dyspnea/altered mental status/pulmonary consolidation/ WBC count of > 12,000 cells/l).³ Exclusion criteria were - previous hospitalization in last 3 weeks/An alternative diagnosis like pulmonary-emboli/pulmonary-edema/malignancy etc. during follow-up/ Tuberculosis/ lung cancer/ severe immunosuppression, HIV infection/solid-organ or BM transplantation, systemic corticosteroid treatment etc.³

Subjects were categorized into 3 categories - Mild (outdoor treated), Moderate (Indoor admitted) and Severe (ICU admitted).¹

Sputum samples were collected as per standard guidelines, preferably before antibiotic administration.⁷ Semiquantitative culture technique was adopted.⁷ Suitability of Sputum samples (for culture) was checked as per Murray-Washington criteria defined elsewhere.⁸ Selected samples were homogenized by use of dithiothreitol (Mucosol) and mechanical method (for Mycoplasma).⁹

Homogenized samples were subjected to culture by standard semi quantitative culture method.⁷ 0.005 ml each of this (representing 0.000025 ml of original unhomogenized sputum sample) was inoculated into 4 different culture media {Blood agar, MacConkey agar, Chocolate agar and CVNG agar (Crystal violet, Nalidixic acid, gentamicin blood agar - selective for pneumococci)}. Blood agar and MacConkey agar plates were incubated aerobically at 37°C overnight while CVNG agar (with Optochin disc) and Chocolate agar were incubated with 5-10% CO₂ under similar environment.^{7,10} After incubation, presence of 25 or more colonies of the same agent (in any plate) implied presence of 10⁶ or more of this agent per ml of original sputum, indirectly suggesting a pathogenic role. Any growth lesser than this was dis-regarded as commensal/contaminant.⁷ For Mycoplasma, immediately after collection, sputum was homogenized with needle & syringe and about 0.1ml was inoculated into the biphasic media (with the help of a calibrated loop).¹¹ Two mycoplasma media were used i.e. Mycoplasma biphasic PPLO (pleuropneumonia like organism) media (PPLO agar & PPLO broth together) for primary isolation and Mycoplasma agar for identification of Mycoplasma pneumoniae.^{11,12} Detection of mycoplasma growth was carried out by methods described elsewhere.^{11,12} Help from local veterinary Institute was very forthcoming in this endeavour.

Identification and antibiotic susceptibility of the isolates were performed as per standard guidelines.^{13,14}

RESULT

Table outlined below shows the general clinic-epidemiological features of 94 subjects included in the study.

Table 1.1 Age and sex distribution

Age group in years	Male	Female	Total	Percentage
20-29	8	3	11	11.70
30-39	13	5	18	19.15
40-49	20	7	27	28.72
50-59	14	5	19	20.21
60-69	10	2	12	12.77
70-79	5	2	7	7.46
Total: (%)	70(74.47)	24 (25.53)	94(100)	100

Table 1.2 Mean ages in different groups

Group	Mean age in years	Standard deviation
Male (n=70)	46.53	13.67
Female (n=24)	45.49	13.46
Outdoor patients (n=64)	44.03	13.49
Indoor patients (n=24)	52.08	12.42
ICU patients (n=6)	46.67	13.68
Over all (n=94)	46.23	13.55

Table 1.1 and Table 1.2 clearly shows Majority subjects belong to age group 40-60 years, mostly male and outdoor type, Mild CAP

Table 1.3 Clinical presentations

Clinical Findings	Number of subjects	Percentage
Cough	94	100%
Expectoration	89	94.68%
Fever (> 37.8°C)	81	86.17%
Chest pain	52	55.32%
Difficulty in respiration	24	25.53%
Alt. mental status	7	7.45%
Clinical consolidation	57	60.62%
Hemoptysis	4	4.26%

Table 1.4 Severity of illness

Age group in years	Mild CAP (Outdoor treated)	Moderate CAP (Indoor treated)	Severe CAP (ICU treated)	Total
20-29	9	1	1	11
30-39	16	2	0	18
40-49	18	7	2	27
50-59	11	6	2	19
60-69	6	5	1	12
70-79	4	3	0	7
Total	64 (68.09%)	24 (25.53%)	6 (6.38%)	94 (100%)

Table 1.3 and 1.4 shows that cough, fever and expectorations are the major clinical presentation. Mild CAP was more in young and severe in older subjects. (number was not sufficient for statistical evaluation)

Table 1.5 Culture result, growth pattern and isolates

Culture results & growth pattern	Samples: culture positive			Samples: culture negative: no (%)	Total
	Monomicrobial: no (%)	Polymicrobial: no (%)	Total (%)		
	53 (56.38)	2 (2.13)	55 (58.51)	39 (41.49)	94 (100)
Organism isolated	53 (92.98)	4 (7.02)	57 (100)		

Table 1.5 shows that 58.51% samples yielded significant growth with 53 samples mono-microbial, while 2 samples yielded double bacterial isolates. Total isolates recovered were 57 (53 & 4).

Table 1.6 Organisms isolated in culture positive samples

Organism isolated	Number of isolate from monomicrobial growth	Number of isolate from polymicrobial growth	Total	
			Number	Percentage
<i>Streptococcus pneumoniae</i>	24	0	24	42.1
<i>Klebsiella pneumoniae</i>	14	2	16	28.1
<i>Staphylococcus aureus</i>	4	2	6	10.5
<i>Moraxella catarrhalis</i>	5	0	5	8.77
<i>Pseudomonas aeruginosa</i>	3	0	3	5.26
β -hemolytic <i>Streptococcus</i>	1	0	1	1.75
<i>Escherichia coli</i>	1	0	1	1.75
<i>Mycoplasma pneumoniae</i>	1	0	1	1.75
Total	53	4	57	100

Table 1.6 depicts : *Streptococcus pneumoniae* to be the predominant isolate (42.1%), followed by *Klebsiella pneumoniae* (28.1%), *Staphylococcus aureus* (10.5%) and *Moraxella catarrhalis* (8.8%) . There were other isolates including 1 strain of *Mycoplasma pneumoniae* (after a very laborious culture procedure). Significantly, no *Haemophilus influenzae* isolate found.

Table 1.7 Isolation of pathogens in 3 different grades of illness severity

Organism \ Severity	S P (%)	Kleb (%)	S A (%)	M C (%)	P A (%)	β -HS (%)	EC (%)	MPn (%)	Total organism (%)
Outdoor cases (mild CAP)	18 (51.4)	8 (22.9)	2 (5.7)	4 (11.4)	1 (2.9)	1 (2.9)	0	1 (2.9)	35 (100)
Indoor cases (moderate CAP)	4 (23.5)	7 (41.2)	4 (23.5)	1 (5.9)	0	0	1 (5.9)	0	17 (100)
ICU cases (Severe CAP)	2 (40)	1 (20)	0	0	2 (40)	0	0	0	5 (100)
Total	24 (42.1)	16 (28.1)	6 (10.5)	5 (8.77)	3 (5.26)	1 (1.75)	1 (1.75)	1 (1.75)	57 (100)

(Abbreviation used: SP=*S. pneumoniae*, Kleb=*K. pneumoniae*, SA=*S. aureus*, MC=*M. catarrhalis*, PA=*P. aeruginosa*, β -HS= β -hemolytic *streptococcus*, EC=*E. coli*, MPn=*Mycoplasma pneumoniae*)

Table 1.7 shows pneumococci to be predominant agent in outdoor setting (51.4%) followed by *Klebsiella* (22.9%) and *Moraxella* (11.4%). In Indoor *Klebsiella* was more common (41.2%) while in ICU Gram negative agents were more prevalent with Pneumococci

Table 1.8 Showing pathogen isolation with reference to comorbid illness/ risk factors

Risk factors	<i>S P</i> (%, p value)	<i>Kleb</i> (%, p value)	<i>S A</i> (%, p value)	<i>M C</i> (%, p value)	<i>P A</i> (%, p value)	β - HS(%)	<i>EC</i> (%)	<i>MPn</i> (%)
Smoking	16 (43.2, 0.8679)	13 (35.1, 0.1145)	2 (5.4, 0.795)	2 (5.4, 0.2092)	1 (2.7, 0.4684)	1 (2.7)	1 (2.7)	1 (2.7)
Alcoholism	6 (33.3, 0.4040)	6 (33.3, 0.498)	2 (11.1, 0.6956)	0	1 (5.6, 0.9255)	1 (5.6)	1 (5.6)	1 (5.6)
Diabetes	0	5 (55.6, 0.0092)	2 (22.2, 0.1666)	0	1 (11.1, 0.3424)	1 (11.1)	0	0
Old age	0	4 (80, 0.01)	1 (20, 0.3478)	0	0	0	0	0
Chronic lung disease	2 (25, 0.2502)	2 (25, 0.7828)	0	3 (37.5, 0.0024)	1 (12.5, 0.3424)	0	0	0
Previous hospitalization	14 (50, 0.2276)	7 (25, 0.6118)	2 (7.1, 0.1520)	3 (10.1, 0.6088)	2 (7.1, 0.5311)	0	0	0
Prior antibiotic exposure	19 (38.8, 0.2444)	16 (32.7, 0.499)	6 (12.20, 2842)	3 (6.1, 0.901)	3 (6.1, 0.4623)	1 (2)	1 (2)	0
Precedent viral fever	0	0	2 (100, 0.0001)	0	0	0	0	0

Table 1.8 shows risk factors and co-morbidities associations with agents. Isolation of *Klebsiella pneumoniae* in diabetics and old age, *Moraxella catarrhalis* in chronic lung disease and *S aureus* in precedent viral disease only had statistically significant association.

Table 1.9 Antibigram of *Streptococcus pneumoniae*

<i>Streptococcus pneumonia</i>			
Antibiotic	Sensitive (%)	Intermediate (%)	Resistant (%)
Oxacillin 1 µg	6 (25.0%)		18 (75.0%)
Chloramphenicol	14 (58.33%)	1 (4.17%)	9 (37.55%)
Tetracycline	5 (20.83%)	12 (50.0%)	7 (29.17%)
Erythromycin	15 (62.5%)	2 (8.33%)	7 (29.17%)
Clindamycin	20 (83.33 %)	1 (4.17%)	3 (12.5%)
Linezolid	24 (100.0%)	0	0
Ciprofloxacin	8 (33.33%)	10 (41.67%)	6 (25.0%)
Gatifloxacin	15 (62.5%)	6 (25.0%)	3 (12.5%)
Levofloxacin	10 (41.67%)	10 (41.67%)	4 (16.67%)
Moxifloxacin	23 (95.83%)	1 (4.17%)	0
Ofloxacin	8 (33.33%)	7 (29.17%)	9 (37.5%)
Amoxycylav	13 (54.17%)	3 (12.5%)	8 (33.33%)
Co-trimoxazole	0	0	24 (100.0%)
Vancomycin	24 (100%)	0	0

Table 1.9 shows that all the 24 (100%) isolates of *Streptococcus pneumoniae* were sensitive to Linezolid and Vancomycin, followed by Moxifloxacin (95.84%), Clindamycin (83.33%) and Erythromycin (62.5%). Most importantly 75% isolates yielded Oxacillin (1mcg disc) resistance – indicating a probable PBP2a related resistance with epidemiological significance (needs confirmation by MIC and molecular testing).

Table 1.10 depicts β -lactam therapy in last 3 months was significantly associated with β -lactam resistant *Streptococcus pneumoniae* isolates.

Table 1.10 Risk factors for β -lactam resistant *S pneumoniae* causing CAP

Risk factors	β -lactam resistant <i>Streptococcus pneumoniae</i> (n=18)	Percentage	p value
β -lactam therapy in last 3 months	10	55.56	0.0097
Old age	4	22.22	0.2058
Alcoholism	4	22.22	0.7716
Multiple medical comorbidities	0	0	

DISCUSSION

CAP is easily one of the leading causes of disability and hospital attendance globally, especially in developing countries where health care system is not well equipped.¹⁵ Pneumonia is increasingly recognized as a serious issue among older patients and those with comorbidity.^{1,2} Although not much new antibiotics are in pipeline to tackle this ailment, fast evolution of bacterial resistance here a reality staring at us now. Many respiratory pathogens have become resistant to widely used antimicrobials. *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis* and a number of enteric Gram-negative bacteria are in forefront in this aspect.¹

The subjects in this study were between 20 to 75 years with a highest prevalence in 40-49 year age group (28.72%). This observation was similar to study by Bansal *et al.* patient older than 40 years found to be more predisposed to development of CAP.³² Cough, expectoration & fever were observed to be main features in this study. Bansal *et al.* observed cough in 97%, expectoration in 87%, while fever was present 90% cases.¹⁵

58.51% samples showed growth of isolates, which was similar to isolation rate of Sopena *et al.* at 58%.¹⁶ Ozyilmazet *et al.* found similar rate at 59.4% of samples.¹⁷ Ishida *et al.* in Japan were successful in isolating pathogen from 61% of CAP samples.² On the other hand Bansalet *et al.* detected pathogen in 75% samples.¹⁵

The present study showed the dominance of *Streptococcus pneumoniae* (42.1%). Study by Bansal *et al.* (35.8%) Lim *et al.* (48.0%) and Jokinen *et al.* (41.0%) had similar rate while Peñafiel *et al.* (10.5%), Ishida *et al.* (23.0%) & Ruiz *et al.* (29.0%) had lower rate.^{2, 15, 18, 20, 21}

There was no *Haemophilus influenzae*, an important CAP agent worldwide, isolation in the present study. Bansal *et al.* and Almirall *et al.* also did not find any *Haemophilus influenzae* in their subjects.^{15,22} 75% of the pneumococci isolates were found to be resistant to β -lactam antibiotics. Song *et al.* found 52.4% pneumococcus with reduced susceptibility to penicillin.²³ Kanungo *et al.* found non-susceptibility at 11.6%.⁵ Another study Kanungo *et al.* found 7.3% of isolates to be intermediately resistant to penicillin.⁶ Among many known factors of penicillin resistant Pneumococcus, only β -lactam therapy during last 3 months was found to be statistically significant (p value 0.0097). 62.5% of *Streptococcus pneumoniae* isolates were sensitive to Erythromycin. Amongst the fluoroquinolones, Moxifloxacin was sensitive in 95.83% of isolates while 41.67% isolates were sensitive to Levofloxacin.

Ciprofloxacin sensitivity was observed in 33.33% isolates. This resistance was high compared to other studies worldwide {e.g. Song et al. (11.8%)}.²³ Increasing and indiscriminate use of drugs like Ciprofloxacin could be an explanation of such high rate of resistance observed in this study.

CONCLUSION

The findings in this study revealed that *Streptococcus pneumoniae* and *Klebsiella pneumoniae* are the principal pathogen of CAP, especially the former in mild cases where hospitalization is not required, while the latter may be predominant in moderate to severe cases where patient needs hospitalization. An important aspect of this study finding is the absence of *Haemophilus influenzae*. Antibiotic susceptibility patterns of the isolates clearly suggest existence of drug resistant pathogen of CAP in our setup. The findings, of large proportion of β - antibiotic resistant *Streptococcus pneumoniae* as well as detection of resistance against other common use drugs is really alarming. A wider study with variety of samples and molecular methods may give a better picture of the situation.

Conflict of Interest: None.

Ethical clearance: Obtained.

Source of funding: Self funded.

Authors Contribution: All authors contributed equally.

REFERENCES

1. American Thoracic Society. Guidelines for the Management of Adults with Community-acquired Pneumonia Diagnosis, Assessment of Severity, Antimicrobial Therapy, and Prevention. Am J Respir Crit Care Med. 2001 Jun;163(7):1730-54
2. Ishida T, Hashimoto T, Arita M, Ito I, Osawa M. Etiology of Community-acquired pneumonia in hospitalized patients: A 3 year prospective study in Japan. Chest. 1998 Dec;114(4):1588-93
3. Wattanathum A, Chaoprasong C, Nunthapisud P, Chantaratchada S, Limpairojn N, Jatakanon A et al. Community-Acquired Pneumonia in Southeast Asia: The Microbial Differences Between Ambulatory and Hospitalized Patients. Chest. 2003 May;123(5):1512-19
4. Shah P B, Giudice J C, Griseback Jr R, Morley T F, Vasoya A. The newer guideline for the management of Community-acquired pneumonia. J Am Osteopath Assoc.. 2004 Dec;104(12):521-526
5. Kanungo R, D'Lima D, Rajalakshmi B, Kumar A, Badrinath S. Emerging antibiotic resistant Pneumococci in invasive infections in south India. Indian J Pharmacol. 2002;34:38-43
6. Kanungo R, Rajalakshmi B. Serotype distribution & antimicrobial resistance in Streptococcus pneumoniae causing invasive & other infections in south India. Indian J Med Res. 2001 Oct;114:127-32
7. Duguid J P, Collee J G, Fraser A G. Laboratory strategy in the diagnosis of infective syndromes. In: Collee J G, Duguid J P, Fraser A G, Marmion B P, editors. Mackie & McCartney Practical Medical Microbiology. 13th ed. Edinburgh: Churchill Livingstone; 1989: 600-649
8. Murray P R, Washington J A. Microscopic and bacteriologic analysis of sputum. Mayo Clin. Proc. 1975;50: 339-344
9. NHS Standards Unit, Evaluations and Standards Laboratory, Specialist and Reference Microbiology Division. Investigation of bronchoalveolar lavage, sputum and associated specimens, London: Department of Health; 2005 May 5
10. Nichols T, Freeman R. A new selective medium for Streptococcus pneumoniae. J Clin Microbiol. 1980;33: 770-73
11. Smith T F. Isolation, Identification and Serology of Mycoplasma pneumoniae. In: Wahington II J A, editor. Laboratory procedure in Clinical Microbiology. 1st ed. Boston: Little, Brown and company; 1974. 205-214
12. Morton H E, Smith P F, Lieberman P R. Investigation of the cultivation of Pleuropneumonia-like organism from man. Am. J. Syph. Gon. V. D. 1951;35: 361-369
13. Clinical and Laboratory Standards Institute. Performance Standards for antimicrobial susceptibility testing. 21st Informational Supplement. M100-S21. Clinical and Laboratory Standards Institute, 2011. Villanova, Pa
14. Collee J G, Miles R S. Test for identification of bacteria. In: Collee J G, Duguid J P, Fraser A G, Marmion B P, editors. Mackie & McCartney Practical Medical Microbiology. 13th ed. Edinburgh: Churchill Livingstone; 1989: 141-160
15. Bansal S, Kashyap S, Pal L S, Goel A. Clinical and bacteriological profile of community acquired pneumonia in Shimla, Himachal Pradesh. Indian J Chest Dis Allied Sci. 2004;46: 17-22
16. Sopana N, Sabrià M, Pedro-Botet M L, Manterola J M, Matas L, Domínguez, J et al. Prospective Study of Community-Acquired Pneumonia of Bacterial Etiology in Adults. Eur J Clin Microbiol Infect Dis. 1999 Dec;18(12):852-858
17. Ozyilmaz E, Akan O A, Gulhan M, Ahmed K, Nagatake T. Major Bacteria of Community-Acquired Respiratory Tract Infections in Turkey. Jpn J Infect Dis. 2005;58:50-52
18. Jokinen C, Heiskanen L, Juvonen H, Kallinen S, Kleemola M, Koskela M et al. Microbial Etiology of Community-Acquired Pneumonia in the Adult Population of 4 Municipalities in Eastern Finland. Clin Infect Dis. 2001 Apr;32: 141-154
19. Lim D, Schlaeffer F, Boldur I, Lieberman D, Horowitz S, Friedman MG, et al. Multiple pathogens in adult patients admitted with community-acquired pneumonia: a one year prospective study of 346 consecutive patients. Thorax. 1996; 51: 179-184
20. Lim W S, Macfarlane J T, Boswell T C J, Harrison T G, Rose D, Leinonen M et al. Study of community acquired pneumonia aetiology (SCAPA) in adults admitted to hospital: implications for management guidelines. Thorax. 2001;56: 296–301
21. Peñafiel F S, O'Brien A, Gollerinoc A G, Gontupild G F, Fuenzalida A D. Community-Acquired Pneumonia Requiring Hospitalization in Immunocompetent Elderly Patients: Clinical Features, Prognostic Factors and Treatment. Arch Bronconeumol 2003;39(8): 333-40
22. Almirall J, BolóÁbar I, Vidal J, Sauca G, Coll P, Niklasson B et al. Epidemiology of community-acquired pneumonia in adults: a population-based study. Eur Respir J. 2000;15: 757-763
23. Song J, Jung S, Ko K S, Kim N Y, Son J S, Chang H, et al. High Prevalence of Antimicrobial Resistance among Clinical Streptococcus pneumoniae Isolates in Asia (an ANSORP Study). Antimicrob Agents Chemother. 2004 Jun;48(6): 2101-07

ORIGINAL PAPER

Role of viruddha ahara as causative factor in vicarcika in relation to IgE and AEC level

Choudhury Burhanuddin¹, Kalita Upen², Deka Himamoni³

Received on November 30, 2017; editorial approval on March 20, 2018

ABSTRACT

Introduction: Skin disorder is a challenge to the medical sciences since the time immemorial. In Ayurveda it was beautifully described about the twaksar purusha and all the skin disorders under the heading of kustha which commonly occurs due to incompatible food habits. Personal history is an important determinant to evaluate kustha. **Methods:** Total 50 patients of Vicarcika (Allergic dermatitis), 09 – 70 years were selected randomly from OPD, Govt. Ayurvedic College & Hospital. **Results:** In the series of trials, significant result was observed in relation to age, sex, occupation, religion, socio-economic status and sleep. 30 days was taken as trial period and after that period some satisfactory effect was observed. **Discussion:** Ahara plays a pivotal role in the maintenance of health for which it has been given the prime place among Trayopastambhas, i.e. ahara, nidra and brahmacharya. This study was found to be in consistent with other studies carried out in different parts of the world. **Conclusion:** Statistically significant results indicate effective intervention of compatible food for decrease in vicarcika. This study may be used as a baseline study for more advanced studies.

Keywords: Trayopastambha, Nidra, Brahmacharya, Twak, Kustha

INTRODUCTION

Ayurveda is the science of life which envisages complete regimen for both healthy and diseased one. Ahara, Nidra and Brahmacharya are three sub pillars, which support the body itself.¹ Ahara plays a decisive role in development, sustenance, reproduction and termination of life. The practice of dietetics is an ancient, empirical and elegant art. Hardly one or two percent individuals in India follow the codes and rules of dietetics. There may be various factors responsible behind this non-observance of the dietetic codes.² Man has a natural tendency towards changing lifestyle and the food habits. But

either by ignorance or by carelessness nobody cares about the food habits for which the individuals have to suffer from some problems as well as skin disorder.³

The human skin (Twak) is the largest organ and protective outer covering of the body accounting for about 16 percent of a person's body weight.³ Charak Samhita, Susruta Samhita, Astanga Samgraha and Astanga Hriday all described beautifully about twaksar purusha and all the skin disorders under the heading of kustha.⁴ This Kustha roga is divided into seven mahakustha and eleven ksudra kustha and "Vicarcika" comes under Ksudra Kustha. Most of the clinical features of Vicarcika are similar to the allergic dermatitis in modern concept like blackish brown eruptions associated with itching sensation, pain, excessive exudation or dry lesion occurring all over the body and comparatively more on hands and legs.⁵

In this study it has to evaluate the role of Viruddha Ahara in kustha roga with emphasis on Vicarcika (Allergic Dermatitis). 50 diagnosed cases of Vicarcika from OPD, Govt. Ayurvedic College and Hospital were evaluated on pre and post test open trial on the basis of a pre designed format. Diet habit in relation to Viruddha Ahara as mentioned in Ayurveda were recorded in the beginning and their blood parameters; Absolute Eosinophil Count (AEC), IgE were evaluated. Then they were advised not to intake some specific Viruddha Ahara for a period of one months. The effect of this treatment principle

Address for correspondence:

¹ Practitioner, Nivriti Lodge, House No. 205-AG.S. Road, Dispur Guwahati-06, Assam. Pin-781006

² Lecturer, Sharir Kriya Vigyan, Govt. Ayurvedic college

Email: kalitaupen4@gmail.com

Mobile: +919864210644

³ Assistant Professor (**Corresponding Author**)

Department of Anatomy, Gauhati Medical College, Guwahati, Assam

Email: dekahimamoni4@gmail.com

Mobile: +919864324646

Cite this article as: Choudhury Burhanuddin, Kalita Upen, Deka Himamoni. Role of viruddha ahara as causative factor in vicarcika in relation to IgE and AEC level. *Int J Health Res Medico Leg Prae* 2018 July;4(2):81-84. DOI 10.31741/ijhrmlp.v4.i2.2018.19

were evaluated on specific subjective and objective parameters using proper statistical method.⁶

Objectives: To observe the effect of Viruddha Ahara as causative factor in Vicarcika based on observation in relation to I_gE and AEC level in pre and post test of trial period.

MATERIALAND METHODS

A total number of 50 patients were selected randomly from O.P.D. of Govt. Ayurvedic College and Hospital, Jalukbari, Guwahati, Assam to evaluate the role of Viruddh Ahara in causing Vicarcika in relation to I_gE and AEC level in each patient. Patients were selected irrespective of age, sex, caste, occupation and socio economic status. AEC and IgE concentration differences were evaluated on pre and post trial period of one month and compared.

Table 1 Subjective Assessment criteria

Severity of itching	Severity of pain	Grading of Severity
No itching	No pain	Grade 0
Mild itching	Mild pain	Grade 1
Moderate itching	Moderate pain	Grade 2
Severe itching with sleep	Severe pain	Grade 3

Table 2 Objective Assessment criteria

Severity of discharge	Distribution of Papules (pidaka)	Grading of Severity
No discharge	No pidaka	Grade 0
Mild discharge, just to wet the lesion	1-10 pidakas in 4 sq inch area	Grade 1
Moderate discharge	10-20 pidakas in 4 sq inch area	Grade 2
Profuse discharge	> 20 pidakas in 4 sq inch area	Grade 3

RESULTS

The results and observations of the present study are presented as follows:

Table 3 Distribution of patient according to Serum IgE level (Pretest; Day 0)

Sl. No	Ig E (Pretest)	No. of patient	%
01	Normal	10	20
02	Below 500	23	46
03	Above 1000	17	34

Table 3 depicts that out of 50 patients, majority of patients i.e. 46% were having Ig E level below 500, 34% were having Ig E level above 1000 and 20% were having Ig E level normal

Table 4 Distribution of patient according to Serum IgE level (Post-test; day 30)

Sl. No	Ig E	No. of patient	%
01	Normal	19	38
02	Below 500	25	50
03	Above 1000	06	12

Table 4 depicts that out of 50 patients, majority of patients i.e. 50% were having Ig E level below 500, 12% were having Ig E level above 1000 and 38% were having Ig E level normal after withholding Virudha Ahara for 1 month period.

Table 5 Distribution of patient according to AEC level (Pre-test; day 0)

Sl. No	Ig E	No. of patient	%
01	Normal	07	14
02	Below 500	30	60
03	Above 1000	13	26

Table 5 depicts that out of 50 patients, majority of patients i.e. 60% were having Ig E level below 500, 26% were having Ig E level above 1000 and 14% were having Ig E level normal

Table 6 Distribution of patient according to AEC level (Post-test; day 30)

Sl. No	Ig E	No. of patient	%
01	Normal	23	46
02	Below 500	21	42
03	Above 1000	06	12

Table 6 depicts that out of 50 patients, majority of patients i.e. 46% were having IgE level normal, 42% were having IgE level below 500 and 12% were having IgE level above 1000 after withholding Virudha Ahara for 1 month period.

DISCUSSION

Wholesomeness of food varies person to person. Caraka enumerated eight factors and entitled them as “Astaaharavidhi Visayatana”. These factors are the tools to decide wholesomeness or unwholesomeness of a food substance by specifying the method of eating, preparations or arrangements for dieting and classification of food particles

etc. These are (1) Prakrti (2) Karana (3) Samyoga (4) Rasi (5) Desha (6) Kala (7) Upayogasamstha and (8) Upayokta.⁷

If a person doesn't follow these factors, then his diet may turn as Viruddhahara. Caraka says that those viruddhahara vitiates the dosas, but does not eliminate them from the body. There are so many terms which are related to Viruddhahara like Mithyahara, Adhyashana, Visamshana. Hita, pathya, satmya and upasaya, which are used to impart the perception of wholesomeness. Hitakara term is used for generalized rules for human beings or mass personality Ahara. This term is used mostly at respective to healthy state of individual. Pathya term is mostly related to the diseased condition, prakrti condition, Bala, Vrddha, Madhya, Vaya, etc. This term is used mostly in ill condition, i.e., Aturavastha. Susruta has supported this and mentioned Ekanta Hitakara and Avasthanusara Hitakara. Food substances may prove to be incompatible in many ways. Some due to their mutually contradictory qualities, some by combination, some by the method of preparation, some by virtue of the desha (place), kala (time) and matra (dose) and some others by their inherent nature. There are significant role of these desha, kala, matra, samskara, agni, etc.⁸

The use of dry, hot and other similar quality of food substances in a dry region (Jangala Desha) and the use of unctuous, cold and other similar quality of food substances in a wet region (Anupadesha) are examples of incompatibility of diet and leading to diseases. Anupadesha is having Kapha Dosa and Madhura Rasa dominancy. So people of Anupadesha are having Kaphadosa and Madhura Rasa dominancy naturally. Therefore people of Anupadesha are more prone to type of diseases, which are having dominancy of Kaphadosa and Madhura Rasa.⁹ Therefore in this condition consuming of unctuous, cold and other similar quality of food substances become Viruddha to Anupadesha people. Similarly, Jangala Desha are having Vata, pitta and Katu Rasa dominancy, so people of Jangaladesha are more sensitive to that diseases which are caused by Katu rasa and Vata, pitta Dosa predominancy. Therefore this type of diet becomes Viruddha in Jangaladesha. Like this kala, matra, samskara, agni all have significant influence in causing incompatibility of food as well as causing body disorders.¹⁰ According to Gangadhara and Cakrapani, Viruddhahara is misuse of the sense of taste. Continuous intake of Viruddhahara leads to vitiation of agni, which is root cause of every disease.¹¹

In case of blood parameter IgE, on day 0, i.e. pre test of trial period, out of 50 patients, majority of patients i.e. 46% were having IgE level below 500, 34% were having IgE level above 1000 and 20% were having IgE level normal. whereas on day 30 i.e. post test of trial period, out of 50 patients, majority of patients, i.e. 50% were having IgE level below 500, 38% were having IgE level normal and 12% were having IgE level above 1000.

Again in case of the parameter AEC on day 0 i.e. pre test of trial period, out of 50 patients, majority of patients i.e. 60% were having AEC level below 500, 26% were having AEC

level above 1000 and 14% were having AEC level normal. Whereas on day 30 i.e. post test of the trial period, out of 50 patients i.e. 42% were having AEC level below 500, 12% were having AEC level above 1000 and 46% were having AEC level normal.

CONCLUSIONS

Concept of Ahara is one of the prime and novel concepts Ayurveda. The ahara prepared without astaaharavidhi visesayatana, harms the body. Viruddhahara induces pathology upto 3 initial stages of kriya kala sanchaya, prakopa and prasara and it produces prepathogenic condition forming platform for vyadhi utpatti.¹² Among the viruddha ahara concept, especially by Samyoga viruddha it is inferred that this hetu is more responsible to cause the allergic disorders as well as the vicarcika vyadhi.¹³ Viruddha ahara if consumed in less quantity is not harmful and if it is consumed regularly in considerable amount then it leads to some diseases.¹⁴ The present study revealed a fruitful result in the Vicarcika patients in case of evaluating and comparing the blood parameters IgE and AEC level which was done in a limited time period and population. So it can be concluded that any further researcher works in the present field will be more helpful to discover and measure the role of viruddhahara. The present researchers will be a podium for further studies.

Acknowledgements: We sincerely acknowledge the patients who participated in the work.

Ethical clearance: Taken.

Source of funding: Nil.

Conflict of interest: None declared.

REFERENCES

1. Agnivesha, Charaka, Dridhabala, Vidyotini Hindi Commentator, Shastri Kasinatha, Chaturvedi Nath Gorakha. 2nd ed. Varanasi: Choukhamba Bharati Academy; 2005. p. 221-223. Vol. 1.
2. Shimizu H. A Text book of dermatology. 2nd ed. John Wiley & Sons. 2007. p. 120.
3. Charaka, Chakrapani, Ayurveda Dipika, (Text with English translation and Critical exposition based on Chakrapani Datt's Ayurveda Dipika by Sharma R.K, Dash Bhagawan. 2nd ed. Varanasi: Choukhamba Sanskrit Series Office; 2007. p. 197-199. Vol. 2.
4. Sushruta Samhita by Kaviraj Ambika data shastri. 3rd ed. Varanasi: Choukhamba Sanskrit Series Office; 2007. p. 421-423. Vol. 2.
5. Atridev GK. Astanga Sangraha. 2nd ed. Varanasi: Krishnadas academy; 1993. p. 339-340. Vol. 1.
6. Mahajan BK. Methods in Biostatistics for Medical Students and Research Workers. 7th ed. New Delhi: Jaypee Brothers and Medical Publishers; 2009. p. 127-140.
7. Vagbhata, Arunadatta Hemadri, Astanga Hridaya with

- commentary Ayurveda Rasayana and Sarvagasundara. 9th ed. Varanasi: Choukhamba Orientalia; 2002. p. 452-453.
8. Charaka, Chakrapani, Ayurveda Dipika (Text with English translation and Critical exposition based on Chakrapani Datt's Ayurveda Dipika), by Sharma R.K, Dash Bhagawan. 2nd ed. Varanasi: Choukhamba Sanskrit Serie Office; 2007. p. 267-269. Vol. 3.
 9. Sushruta and Data Shastri Kaviraj Ambika. Sushrut Samhita. 2nd ed. Varanasi: Choukhamba Sanskrit Series Office; 2007. p. 345-347. Vol. 1.
 10. Sushruta, Dalhanacharya, Gayadasacharya, Sushruta Samhita with Nibandha Sangraha and Nyayacandrika Panjika Commentary on Nidanasthana, edited by Vaidya Jadavaji Trikamji Acharya. 8thed. Varanasi: Chakhaumba Orientalia; 2005. p. 334-336. Part 1
 11. Sharangdhra, Srikanta Murthy K.R. Sharangadhara Samhita, 2nd ed. Varanasi: Chaukhamba Orientalia; 1995. p. 278-279.
 12. Srikantha Murthy KR. Doctrines of Pathology in Ayurveda. 3rd ed. Varanasi: Chaukhambha Publishers; 2003. p. 199-201.
 13. 135 Tom Ogren; Local Honey and Allergies; Website - www.allergyfree-gardening.com. 2007.
 14. 165 <http://www.informahealthcare.com>; Immunological Investigations; 2009.

ORIGINAL PAPER

Profile and knowledge of blood donors: a study in a blood bank of a tertiary care centre

Bhattacharjee Ajanta¹, Thakuria KD², Mahanta Putul³

Received on February 10, 2018; editorial approval on March 20, 2018

ABSTRACT

Introduction: Blood is the only oxygen carrier in the body and is critical in saving human lives. The attitude, beliefs, and level of knowledge associated with blood donation will determine whether probable donors will donate blood or not. **Methodology:** This descriptive study with cross sectional study design will be conducted among the blood donors attending the blood bank of Tezpur Medical College and Hospital in the age group from 18 to 60 years in the department of Blood bank under Pathology with due consent. **Results:** The response rate is 76%. The age group (20-29) years has maximum response in terms of blood donation, i.e., 11(28.9%). Male outnumbered the female with a ratio of 2.16:1. In terms of body weight among the donors in the range of (50-59) kg has the maximum positive response, i.e., 13(34.2%). In this study, the student group comprising 15(39.5%) were the highest to respond for blood donation for the cause. **Conclusion:** Volunteering behavior is based on culture and determined by various factors like religion, age, sex, attitude and occupation.

Keywords: Blood donation, voluntary donors, replacement donors, student

INTRODUCTION

Blood is the only oxygen transporter in the body and is crucial in saving lives. Even years of extensive research failed in this field of blood donation to find a true substitute for blood and blood components may not be available for many years.¹ Therefore, blood donation by humans will continue to be the major source for blood and blood components.²

A tertiary care centre rely on the patient's relative for to donate the blood sample due to not having enough voluntary blood donations to help the needy patients.² Maximum blood donation in tertiary care centre is on replacement basis. Blood banks pressurize the doctors, the nurses and the relatives of the patient and urge them to send replacement donors to maintain their stock. Thus the relatives of the patients are

compelled in to finding donors. Many of a time professional blood donors are brought to donate blood in a way of replacement donors. This is a very risky situation as professional donors constitute a group with high-risk behavior leading to greater chances of transfusion-transmitted diseases.³

Like in any developing country in India too, there is a dependency on family replacement and remunerated donors. Though the World Health Organization advocates that member states should establish national blood transfusion services that will operate on the basis of voluntary, non-remunerable basis⁴, family/replacement donors still provide more than 45% of the blood collected in tertiary care centre's blood banks.⁵

This study was thus undertaken among blood donors attending the Blood bank of Tezpur Medical College and Hospital to find out their socio-demographic profile, knowledge and practice regarding blood donation.

MATERIAL AND METHODS

This descriptive study with cross sectional study design was undertaken among the blood donors attending the blood bank of Tezpur Medical College and Hospital from December 2016 to December 2017. A total of 50 blood donors who came to donate blood during this study period in the age group from

Address for correspondence:

¹Assistant Professor

Dept. of Pathology

Email: ajanta_dr@hotmail.com

Mobile: +919864043215

²Assistant Professor

Dept. of Physiology (**Corresponding Author**)

Email: kahuadas@gmail.com

Mobile: +919864051806

³Associate Professor

Dept. of Forensic Medicine

Tezpur Medical College and Hospital, Tezpur, Assam and India

Cite this article as: Bhattacharjee Ajanta, Thakuria KD, Mahanta Putul. Profile and knowledge of blood donors: a study in a blood bank of a tertiary care centre. *Int J Health Res Medico Leg Prae* 2018 July;4(2):85-87 DOI 10.31741/ijhrmlp.v4.i2.2018.20

18 to 60 years in the department of Blood bank (Under Pathology) were randomly picked up. The final sample size thus came out to be 50.

An exit interview of the blood donors after donating blood was taken using a predesigned and pretested structured questionnaire. The study variables included age, sex, occupation and body weight. Informed consent was taken. The data thus obtained was analyzed using MS Excel.

RESULT

A total of 50 blood donors were interviewed upon which only 38 consented to respond the questionnaire with a response rate (RR) of 76%. **Table 1** shows the distribution of the study population according to their socio-demographic profile.

Table 1 Distribution of the Blood Donors according to their Socio-Demographic Characteristics

Variables	Number	Percentages
Age in Years		
<20	2	5.3
20-29	11	28.9
30-39	10	26.3
40-49	0	0
50-59	5	13.2
≥60	10	26.3
Gender		
Male	26	68.4
Female	12	31.6
Weight (in kg)		
50-59	13	34.2
60-69	11	28.9
70-79	10	26.3
≥80	4	10.5
Occupation		
Student	15	39.5
Housewife	6	15.8
Service	4	10.5
Business	7	18.4
Farmer/Laborer	6	15.8
Donor Type		
Voluntary Blood Donor	19	50.0
Patient's Attendant	19	50.0

The age group of 20-29 years has a maximum representation, i.e., 11(28.9%) in terms of blood donation with a minimum representation from the young age group of 20 years and below, i.e., 2(5.3%) as shown in **Figure 1**.

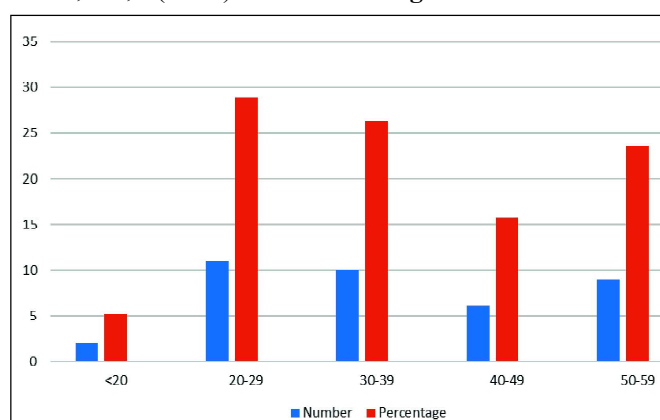


Figure 1 Age variable among blood donors

Male outnumbered the female with a ratio of 2.16:1.

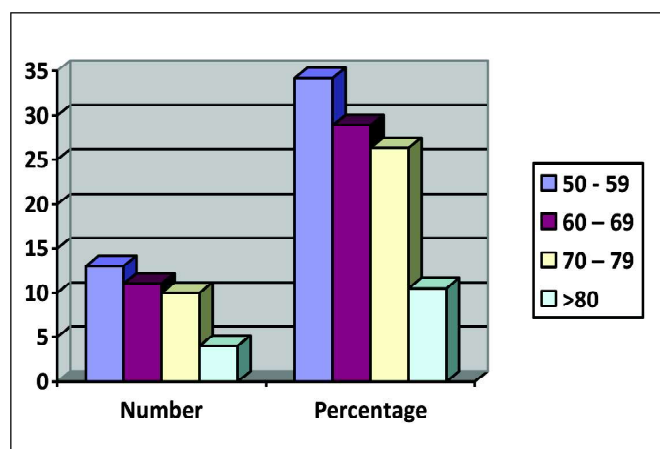


Figure 2 Distribution of variable of body weight among blood donors

In terms of body weight among the blood donors in the range of 50-59 kg has the maximum positive response, i.e., 13(34.2%) and the group of 80 kg and above have the minimum representation as shown in **Figure 2**. In this study, the student group has 15(39.5%) outnumbered the other occupation in terms of blood donation for the cause with a minimum representation from service holder group 4(10.5%).

DISCUSSION

In the current study 11(28.9%) representations from the study population belonged to 20-29 years of age group. A study conducted by Uma et al⁶ in Chennai found increased numbers of young donors who were in the age group of 18-25 years (61%). In contrast, Sampath et al⁷ showed that 48.4% of the donors were in the age group of 26-50 years which tallied out findings.

The number of female donors in our study was 12(31.6%), low as compared to males with a ratio of 2.16:1. This is corroborated by similar findings in the Chennai study as well

as a study carried out by Agarwal et al.⁸ There may be various reasons for the low percentage of female donors like poor nutrition, low weight, and fear of pain. In a study which was done by Hollingsworth⁹, female donors constituted only 1% of the donor population.

In terms of body weight among the donors in the range of 50-59 kg have the maximum positive response, i.e., 13(34.2%). This positive response may be because of sound health they enjoying within this group of body weight.

The student group comprises 15(39.5%) which was highest in the study population. The observation that knowledge score increased with education levels ($p < 0.05$) seems to be logical since education would also increase awareness about all possible information related to blood donation. There is also a higher probability of having been exposed to a voluntary blood donation camp in one's educational institute since these camps are common in educational institutes. The involvement of student group in blood donation with highest 39.5% among all group in this study is in agreement with study¹⁰ carried out in Tanzania where voluntary blood donation correlated with secondary school attendance.

CONCLUSION

The demand for blood products is ever lasting and increasing. Concurrently, blood donor enrolment becomes more and more difficult and scanty. Therefore, in this occasion volunteer blood donation should be encouraged, especially the young generation, as they can be a healthy and continuous donor. Volunteering behavior is based on culture and demographic variables and determined by various factors like age, sex, body weight and occupation, etc. Volunteer donors feel it as a responsibility to help others, regardless of personal connection. Our study found that all the respondents in the category of cultivators were willing to donate blood again if required in future. This positive feeling should be encouraged with proper knowledge regarding blood safety to meet the demand of blood requirement.

Conflict of interest: No conflict of interest associated with this work.

Ethical issues: Ethical clearance was taken from the institutional ethics committee.

Source of funding: None.

Author's contribution: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Lowe KC, Ferguson E. Benefit and risk perceptions in transfusion medicine: blood and blood substitutes. *Journal of Internal Medicine* 2003;253:498-507.
2. Dutta S, Sinha D, Chatterjee S, Basu M, Misra RN. Profile and Awareness of Blood Donors: A Study In Blood Bank of a Tertiary Care Hospital of Kolkata. *Int J Pharm Sci Res* 2016;7(9):3881-86.
3. N, Thankappan KR, Kartha CC, Pal R. Analyzing Sociodemographic factors amongst blood donors. *J Emerg Trauma Shock* 2010;3:21-25.
4. The Melbourne declaration on 100% voluntary non-remunerate donation of blood and blood components," Composed at World Blood Donor Day. Melbourne, Australia, 2009.
5. National AIDS Control Organization: Voluntary Blood Donation Program -An operational guideline; Ministry of Health and family Welfare 2007:9.
6. Uma S, Arun R, Arumugam P. The Knowledge, Attitude and Practice towards Blood Donation among Voluntary Blood Donors in Chennai. *Indian Journal of Clinical and Diagnostic Research* 2013;7:1043-1046.
7. Sampath S, Ramsaran V, Parasram S, Mohammed S, Latchman S, Khunja R, et al. Attitude towards blood donation in Trinidad and Tobago. *Transfusion Medicine* 2007;17:83-87.
8. Agarwal A, Tiwari A K, Ahuja A, Kalra R. Knowledge, attitude and practices of people towards voluntary blood donation in Uttarakhand. *Asian J Transfus Sci* 2013 Jan-Jun;7(1):59-62.
9. Hollingsworth B, Wildman J. What population influences the decision to donate blood? *Transfusion medicine* 2004;14:9-12.
10. Jacobs B, Berege ZA. Attitudes and beliefs about blood donation among adults in Mwanza Region, Tanzania. *East Afr Med J* 1995;72:345-8.

ORIGINAL PAPER

Physicians' knowledge and patients' understanding of informed consent: challenges in clinical practice

Kumar Manisha¹, Asmita², Bhavya HU³

Received on March 31, 2018; editorial approval on June 30, 2018

ABSTRACT

Aim: To assess physicians' knowledge and to find out its understanding in patients. **Method:** 120 physicians and 280 patients were given separate questionnaires to assess their knowledge and understanding of informed consent. **Results:** 52.3% respondents took less than 10 minutes in taking consent. There was significant difference in providing information about length of hospital stay among junior (57.1%) and senior doctors (88%). Among 266 patients who responded, 102 (28%) were illiterate (group I) and 164 (72%) were literate (group II). In the group I 13.7% knew that consent needs to be taken before the procedure, whereas in group II 50% were aware. 40.2 % among the illiterate group, and 80% of the literate group understood the contents of consent, The anxiety level after consents increased rather than decreasing. **Conclusion:** All components of consent were not communicated to the patients by the physicians. Patients' literacy level increased the understanding of consent.

Keywords: Informed consent, physicians' knowledge, patients' understanding, patients' education, anxiety level

INTRODUCTION

Informed consent is a process of communication between a patient and physician, for patient's authorization to undergo a specific medical intervention.¹ An informed consent is an ongoing process; it involves exchange of information and not mere signing of form. For ethical and legal reasons patients must be fully informed before deciding to undergo a major treatment and consent must be documented in writing.

The socioeconomic status, education of patients and lack of application of knowledge to practice are the main challenges in providing informed consent in developing world. The aim of our study was to assess physicians' knowledge and practice of obtaining informed consent before medical procedures. To find out patients' comprehension of the

process of consent and to observe factors hindering its understanding.

METHOD

The study was conducted from January 2014 – July 2014. All authors were employed in the hospital making it easier to conduct the survey. Separate questionnaire were given to the patient and physician. Total 280 questionnaires were given to the patients admitted in the obstetrics and gynecology ward waiting for operation. 266 forms were duly filled, the patients who were illiterate got the proforma filled by husband or relative who was literate. Total 120 physicians which included senior resident, resident, consultant working in the hospital were distributed the questionnaire by the authors. The physicians present at the time of the survey filled out the questionnaire on their own and returned the completed form to the author who was in charge of the local survey. Participation in the study was voluntary and anonymous. Total 109 proforma were duly filled and returned. Results were analyzed, appropriate statistical analysis was done to compare the variables.

RESULTS

Out of total 109 questionnaires, 84 were filled by resident doctors and 25 by senior doctors of consultant level. Table 1 shows the questions asked and its response. Question number 1- 3 were regarding the doctors understanding of the process

Address for correspondence:

¹Professor

Email: manishaonly@gmail.com

Mobile: +919818014887

²Scientist-I (Corresponding Author)

Email: drasmita_kaundal@yahoo.com

Mobile: +918585707096

³Resident

Dept of Obstetrics and gynaecology
LHMC, New delhi

Cite this article as: Kumar Manisha, Asmita, Bhavya HU. Physicians' knowledge and patients' understanding of informed consent: challenges in clinical practice. *Int J Health Res Medico Leg Prae* 2018 July;4(2):88-92 DOI 10.31741/ijhrmlp.v4.i2.2018.21

Table 1 Shows response of junior and senior doctors to the questions

S no	Questions	Total N= 109	%	Junior doctors N= 84	%	Senior doctors N=25	%	P value
1.	Attainment of higher ethical standards and organizational morale as most important reason for taking consents	77	70.6	60	71.4	17	68.0	0.468
2.	Agreed that the procedure of obtaining informed consent for treatment regulated by law	103	94.5	79	94.0	24	96.0	0.833
3.	Agreed that physician should educate the patient on the issues of providing consent for treatment	107	98.2	82	97.6	25	100	0.475
4.	Spent less than 10 min on consent	57	52.3	53	63.1	4	16.0	0.000
5.	Consent to be taken from patient only	39	35.8	27	32.1	12	48.0	0.398
6.	Gave information to patients about their medical condition and treatment procedures in detail	55	50.5	42	50.0	13	52.5	0.689
7.	Answered to patients' queries in detail	34	31.2	24	28.6	10	40.0	0.509
8.	Informed patients about the length of their hospital stay	70	64.2	48	57.1	22	88.0	0.010
9.	Patient give consent for the treatment after consulting the family	78	71.6	55	65.5	23	92.0	0.091

of consent. Total 77(70.6%) doctors considered attainment of higher ethical standards and organizational morale as the major reason for taking consents. Almost all senior and junior doctors (94.5%) knew that the process of taking informed

consent is regulated by law. When asked whether it is physician or staff nurse who was supposed to provide information on consents 97/109 (89%) felt it was the responsibility of the physicians to provide the information.

Question 4-9 dealt with practical use of their understanding of process of consent. About half of the respondents (52.3%) took less than 10 minutes taking consent. The senior doctors gave significantly more time on taking consents compared to the resident doctors. Among the residents 27/84 said they would take the consents from the patients only, and 12/25 among seniors said they would take consents only from the patients, all others believed consent needs to be taken from patients as well as the relatives. When asked about giving information about the medical condition to the patients half of the doctors said they would inform patient in detail about the medical condition. Similarly patients' queries were provided in detail by only 31.2% of doctors. There was significant difference in providing information about length of hospital stay among junior (57.1%) and senior doctors

(88%). 78/109(71.6%) physicians observed that patients gave consent after consulting the family rather than taking decision independently or upon coercion by physician.

Table 2 shows the questions asked to the patients and its response. Out of 266 duly filled proforma by the patients, 102 (28%) who responded were illiterate and were categorized as group I, 164 (72%) were literate and categorized as group II. In the group I 13.7% knew that consent needs to be taken from them before the procedure, whereas in group II 50% were aware of this. 40.2 % among the illiterate group, and almost 80% of the literate group understood the contents of the consent, there were more among the group I (68%) compared to group II (54.3%) who believed that less than 10 minutes were given for consent but the difference was not significant. Among first group only 7/102 (6.9%) and in

Table 2 Shows response of patients to the questions asked

S no	Questions	Total n= 266	%	Patient illiterate n=102 (group 1)	%	Patients literate N= 164 Group 2	%	P value
1	Wanted that the consent being taken from them	90	50	14	13.7	82	33.8	0.000
2	Were aware that the consent was taken before the procedure	237	95.7	80	78.4	157	89.1	0.000
3	Agreed to have understood the content of the consent	172	79.9	41	40.2	131	64.7	0.000
4	Agreed that < 10 min was given to take the consent	158	54.3	69	68	89	59.4	0.117
5	Had knowledge about the nature of the operation being performed	79	43.9	7	6.9	72	29.7	0.000
6	Had information regarding why it was performed	194	82.3	59	57.8	135	72.9	0.001
7	Was made aware of its complications	89	46.3	13	12.7	76	33.5	0.000
8	Were informed about alternative treatments and its risk	119	53.7	31	30.4	88	44.7	0.000
9	The anxiety level increased after the consents	116	37.2	55	53.9	61	43.6	0.000

group II 70/164 (43.9%) knew about the nature of operation being performed. When asked regarding reason why it was performed 59/102 in group I and 135/164 in group II knew the motive. Only 13/102 patients in group I and 76/164 in second group were more informed about the complications, whereas 31/102 and 53/164 were informed about alternative treatment in first and second group respectively. The anxiety level after consents increased rather than decreasing in 55/102 in group I whereas in 61/164 in group II. There was significant difference in all responses between illiterate and literate patient except in time taken in which there was no significant difference.

DISCUSSION

The present paper deals with the physicians' understanding of basic principles and purpose of consents; it also tries to find out the practical aspects, application of knowledge about different elements that constitute informed consent. In our hospital set up majority of the consents are taken by resident doctors therefore estimation of their knowledge and understanding was very important.

In our study we found that the physicians had adequate knowledge regarding the purpose of taking consents but their understanding of consents was not curriculum based therefore the junior doctors lacked the basic knowledge about from whom to take the consent from, as half of them thought consent needs to be taken from relatives as well as the patients. The consent was taken by junior doctors in most of the cases, who devoted less time than required for the consents. Therefore were not able to develop good communication and did not provide detailed information about alternative treatment, complications duration of hospital stay. Consent should be incorporated in undergraduate and postgraduate medical training so that comprehensive knowledge about consent is developed. Also there is no provision of written format of consent in government hospitals of the country, therefore many vital components of consent is missed even though consent is taken. A properly constructed and clearly formatted consent form providing clear and simple information about procedures in local language would improve patient comprehension and would lower patient anxiety levels. Repeating information to patients using various formats and modes at different times can strengthen comprehension and recall.²

As this hospital is a tertiary care government hospital it generally caters to lower middle and low income group patients and therefore has a mixed bag of illiterate, semi and literate patients. We tried to find out the patients' understanding of different aspects of consent and the ground reality about whether the basic purpose of consent regarding patient safety and satisfaction is fulfilled or not.

One of the basic tenets of process of consent is that the information should be comprehensible to the patient and the patient should set reasonable expectations. We found that same amount or even lesser time was given to illiterate patients probably because the attending doctor did not felt the need

to convince the satisfy the patient about the various aspect of treatment given. In almost all areas the perception of an illiterate patients differed from literate patients but as no extra efforts were taken to meet the needs leading to significant difference between the understanding among illiterate and literate patients.

Although literacy level helped patients in understanding of the process of consent but it is important to educate and make people aware of their legal right to informed consent, public health programmes to create such awareness is needed. Patients should be provided information regarding complications, alternative treatment, and length of hospital stay giving them opportunity and right to choose. Physicians should make sure that their counselling about specific risks and benefits is based on current evidence.³

A Study done by Sanwal et al contradicted the myth that patients in India do not need to be told about their operations They are unable to understand the complexities and forget the salient facts soon afterwards however in their study they found that 70% of the patients recalled the relevant data. 98 of the 100 patients appreciated being given the information because they said it reduced their anxiety.⁴

One of the major purposes of the informed consent process is to reinforce a patient's understanding of her condition and treatment alternatives and to thoroughly review the chosen procedure with its risks and benefits. Preoperative education and discussion is a crucial part of the surgeon-patient relationship.⁵ This process, which includes obtaining written consent from the patient to perform surgery, aims to ensure that the patient has an accurate understanding of her condition, the treatment alternatives, the course of recovery, and appropriate comprehension of the risks, benefits, and potential complications of the planned operative procedure.^{6, 7}

A study done by Adam et al to evaluate how well women who consented to undergo sacrocolpopexy understood their planned procedure found that despite detailed preoperative discussion, women had deficiencies in their understanding of sacrocolpopexy they concluded that new methods to improve patient education and comprehension should be considered.⁸ Audio and video-based presentation methods also have been used, sometimes with better results.⁹

Although the physicians had basic understanding of consent, all the components of consent process was not communicated to the patients by the physicians. There was significantly low level of understanding of the consent process by patients leading to their increase in anxiety after consent, this difference was more significant in illiterate patients.

Disclosure: None declared.

Funding: There is no funding from any source.

Ethical Clearance: Taken.

Author Declaration: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. American Medical Association. Informed consent. American Medical Association. April 11, 2001.
2. Hoehner PJ. Ethical aspects of informed consent in obstetric anesthesia--new challenges and solutions. *J Clin Anesth* 2003 Dec;15(8):587-600.
3. ACOG Committee Opinion No. 578: Elective surgery and patient choice. *Obstet Gynecol* 2013 Nov;122(5):1134-8.
4. Sanwal AK, Kumar S, Sahni P, Nundy S. Informed consent in Indian patients. *J R Soc Med* 1996 Apr;89(4):196-8.
5. Ogburn T. Making and Informed Consent for Hysterectomy. *Clin Obstet Gynecol* 2013 Oct 18.
6. Pape T. Legal and ethical considerations of informed consent. *AORN J* 1997;65:1122-7.
7. Stewart MA. Effective physician-patient communication and health outcomes: a review. *CMAJ* 1995;152:1423-33.
8. Adams SR, Hacker MR, Merport Modest A, Rosenblatt PL, Elkadry EA. Informed consent for sacrocolpopexy: is counseling effective in achieving patient comprehension? *Female Pelvic Med Reconstr Surg* 2012 Nov-Dec;18(6):352-6.
9. Hopper KD, Zajdel M, Hulse SF. Interactive method of informing patients of the risks of intravenous contrast media. *Radiology* 1994;192:67-71.

ORIGINAL PAPER

Undergraduate medical students' knowledge about principles of research and publications

DebBarma Antara¹, Mahanta Putul², Thakuria KD³

Received on November 30, 2017; editorial approval on March 31, 2018

ABSTRACT

Introduction: Research makes students better scientists, a core part of being a physician, and better prepares them to lead during residency and in practice. It is widely recognized that research is vital for development of medical education. Studies on the benefits of research, over the medical education are rare. **Materials and Methods:** It was a cross sectional descriptive study. Sample size was 100 and was randomly picked up from the undergraduate student community who were in their basic science stage of medical studies at Malabar Medical College and Hospital, Calicut in the year 2015. To determine knowledge about principles of research, participants filled a pretext and pretested questionnaire. Informed consent was taken. The data thus obtained was analyzed using MS Excel. **Results:** 31(31%) students feel confident in interpreting and writing a research paper; 20(20%) students say yes that they have participated in a research project; 3(3%) said that they have written a scientific paper; 73(73%) students feel lack of mentor to be the cause of no publication; 59(59%) participants says thta they can plan and conduct a research project and write a scientific paper while 60(60%) students feel that lack of facility is the cause of no publication or lack of research participations. Lack of fund as root cause of no scientific research was felt by 64(64%). 67(67%) participants say that they lack of required knowledge of research methodology. **Conclusion:** With the limited resources of this study, our findings will have highlighted low to moderate level of knowledge of undergraduate medical students in principles of research methodology and the important impact of research methodology workshops. These findings can be utilized for future health research planning to improve the situation in the field of medical education in India.

Keywords: Medical education, principles of research methodology, impact on performance

INTRODUCTION

Currently it is widely acknowledged that research becomes critical for development of countries and innovations; and outcomes derived from basic and applied research tremendously benefit the community.^{1,2}

Furthermore, shifting research paradigm considers physicians as crucial creators of science through clinical and translational researches. In this regard, medical students who play key roles in helping the progress of science as potential physicians are encouraged to contribute in research projects to promote their independent trainings and skills.³ In other words, health research training is an important part of medical education. There is growing evidence on the importance of the involvement of students in research.⁴

This is more emphasized in developing countries where finance and human resources are limited and there is a critical need for research as a tool to make efficient decisions in order to prevent unnecessary waste. In this regard, it is important to remember that there is some evidence that students with extracurricular research programs and experiences are more likely to become future scientists or physician investigators.^{4,7}

The development of strong research skills and the provision of medical care are inextricably linked. That's why the

Address for correspondence:

¹Assistant Professor of FMT
Malabar Medical College and Hospital, Calicut

Email: antaradebbbarma@gmail.com

Mobile: +918794517591

²Associate professor (**Corresponding Author**)
Department of Forensic Medicine and Toxicology

Email: drpmahanta@gmail.com

Mobile: +919435017802

³Assistant Professor of Physiology
Tezpur Medical College, Tezpur, Assam, India

Cite this article as: Debbarman Antara, Mahanta Putul, Thakuria KD. Undergraduate medical students' knowledge about principles of research and publications. *Int J Health Res Medico Leg Prae* 2018 July;4(2):93-95 DOI 10.31741/ijhrmlp.v4.i2.2018.22

research experience is stressed during the undergraduate medical education program. Therefore, research methodology has been suggested in this study as integrated research into the core curriculum, as well as offering several programs for students to become involved throughout their years of study.

In this study, it has been aimed to assess undergraduate medical students' knowledge in principles of research methodology and its contributing factors.

MATERIAL AND METHODS

It was a cross sectional descriptive study. Sample size was 100 and was randomly picked up from the undergraduate student community who were in their basic science stage of medical studies at Malabar Medical College and Hospital, Calicut in the year 2015. To determine knowledge about principles of research, participants filled a pre-text and pre-

tested questionnaire. Informed consent was taken. The data thus obtained was analyzed using MS Excel.

RESULT

100 students were responded to the questionnaire; therefore, response rate of 100% was observed. 76 (76%) of participants were female and 24 (24%) were male as shown in **Table 1**.

Table 1 Sex distribution of the study participants

Sex	No. of Students	Percent
Female	76	76.0
Male	24	24.0
Total	100	100.0

Table 2 Principles of Research Knowledge of participants

Statement	No. of students (%)			
	Yes	No	Yes with support of seniors	Undecided
Do you feel confident in interpreting and writing a research paper?	31 (31)	15 (15)	40 (40)	14 (14)
Have you ever participated in a research project (apart from mandatory academic projects)?	20 (20)	79 (79)	1 (1)	0 (0)
Have you ever written a scientific paper?	3 (3)	97 (97)	0 (0)	0 (0)
Lack of mentor is the cause of no publication or lack of research participations?	73 (73)	14 (14)	0 (0)	13 (13)
Do you think UG can plan and conduct a research project and write a scientific paper?	59 (59)	8 (8)	30 (30)	3 (3)
Do you think that lack of facility is the cause of no publication or lack of research participations?	60 (60)	35 (35)	0 (0)	5 (5)
Lack of fund is the root cause of no scientific research or lack of publication?	64 (64)	30 (30)	0 (0)	6 (6)
Lack of knowledge of research methodology is the root cause of no publication or lack of research participations?	67 (67)	29 (29)	0 (0)	4 (4)
No future benefit or privileges from Govt. of doing research and scientific publication is the cause of all?	44 (44)	44 (44)	0 (0)	12 (12)
Lack of knowledge of seniors in research and publication is the cause of demotivation leading to all these problems?	39 (39)	45 (45)	0 (0)	16 (16)

Only 3 students have ever written a scientific paper and all the three has written one paper each.

DISCUSSION

Our study shows undergraduate medical students have low-to-moderate knowledge about principles of research and publications. In line with this finding, in a study by Windish et al. on understandings of medical residents of biostatistics and interpretation of results, mean correct answer was 41.4%, indicating low-to-moderate knowledge of the residents in these issues.⁸ Similar findings were observed among physicians practicing in an academic medical center⁹, medical students, first year Croatian medical students¹⁰, Pakistani medical students¹¹, and medical students in South East Europe.¹²

Considering the fact that some chapters of medical curriculum are related to health and epidemiology basics, it was assumed that passing these courses would enormously improve students' knowledge on principles of research methodology. However, our findings indicate that medical curriculum is exclusively important in topics of understanding research and publication. Yet, other team works, motivation from seniors, source of fund, benefits of such works in regards to research achievements, etc. may also contribute to the knowledge of students' in principles of research and publications.

CONCLUSION

In interpreting the results one should consider limitations of our study: First, the study was cross-sectional. Prospective studies would have been beneficial in overcoming this limitation. Second this study was performed over the students of a single medical college, did not evaluated the same in other institutions which may improve students' knowledge on principles of research and publications. Furthermore, similar academic and research potentials of these students have not been evaluated over the knowledge on principles of research.

Apart from the limitations, our findings highlight low-to-moderate level of knowledge of undergraduate medical students in research and publications and the important role of senior's guidance and others in improving students' knowledge. Hence we suggest further researches on students studying in different institutions and students at different stages of medical education which could provide useful information for education and research policy makers.

Conflict of interest: No conflict of interest associated with this work.

Ethical issues: Ethical clearance taken from the institutional ethics committee.

Source of funding: None.

Author's contribution: We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. Levin R. The University as an Engine of Economic Growth. Yale office of public affairs & communications; 2001 [updated 2001; cited]; Available from: URL:<http://opa.yale.edu/president/message>
2. Hather GJ, Haynes W, Higdon R, Kolker N, Stewart EA, Arzberger P, et al. The United States of America and scientific research. *PLoS One* 2010;5(8):e12203.
3. Arsia Jamali, Fatemeh AA, Kiana Hassanpour, Kamyar MM. Undergraduate Medical Students' Knowledge About Principles of Research Methodology and Impact of Extracurricular Principles of Research Workshops: A Cross-Sectional Study in Tehran University of Medical Sciences. *Thrita Stud J Med Sci*.2012;1(1):8-12.
4. Solomon SS, Tom SC, Pichert J, Wasserman D, Powers AC. Impact of medical student research in the development of physician scientists. *J Investig Med* 2003;51(3):149-56.
5. Hren D, Lukic IK, Marusic A, Vodopivec I, Vujaklija A, Hrabak M, et al. Teaching research methodology in medical schools: students' attitudes towards and knowledge about science. *Med Educ* 2004;38(1):81-6.
6. Reinders JJ, Kropmans TJ, Cohen-Schotanus J. Extracurricular research experience of medical students and their scientific output after graduation. *Med Educ*. 2005;39(2):237.
7. Segal S, Lloyd T, Houts PS, Stillman PL, Jungas RL, Greer RB, 3rd. The association between students' research involvement in medical school and their postgraduate medical activities. *Acad Med*. 1990;65(8):530-3.
8. Windish DM, Huot SJ, Green ML. Medicine residents' understanding of the biostatistics and results in the medical literature. *Jama* 2007;298(9):1010-22.
9. Weiss ST, Samet JM. An assessment of physician knowledge of epidemiology and biostatistics. *J Med Educ* 1980;(8):692-7.
10. Vodopivec I, Vujaklija A, Hrabak M, Lukic IK, Marusic A, Marusic M. Knowledge about and attitude towards science of first year medical students. *Croat Med J* 2002;(1):58-62.
11. Khan H, Khawaja MR, Waheed A, Rauf MA, Fatmi Z. Knowledge and attitudes about health research amongst a group of Pakistani medical students. *BMC Med Educ* 2006;(54):54.
12. Burazeri G, Civljak M, Ilakovac V, Jankovic S, Majica-Kovacevic T, Nedera O, et al. Survey of attitudes and knowledge about science in medical students in southeast Europe. *Bmj* 2005;331(7510):195-6.

CASE REPORT

Acrania with placental adhesion: a case report

*Bhattacharyya Nirmal Ch**

Received on April 20, 2018; editorial approval on May 20, 2018

ABSTRACT

Acrania is a rare developmental anomaly characterized by a partial or complete absence of the skull bones along with absence of skin and other soft tissues over the exposed brain tissue. Such cases may be detected during antenatal ultrasonography or in aborted fetuses. It is a lethal anomaly and post natal survival is very rare. Placental adhesions with the exposed neural tissue in anencephalic babies had been reported earlier. A rare case of acrania born with placental adhesion surviving for 35 days after normal vaginal delivery is reported here.

Keywords: *Acrania, anencephaly, placental adhesion*

INTRODUCTION

Acrania is a rare developmental anomaly characterized by a partial or complete absence of calvarium, which may be associated with complete, but abnormal development of brain tissue.¹ Most of the reported cases were detected during antenatal ultrasonography or in aborted fetuses.² As this is a lethal anomaly, very few cases surviving for a brief period after delivery had been reported. Unlike anencephaly, in acrania there is almost complete development of the brain tissue, which is directly exposed to the exterior. Placental adhesions with the exposed neural tissue in anencephalic babies had been reported.^{3,4} A rare case of acrania born with placental adhesion surviving for 35 days after normal vaginal delivery is reported here.

CASE REPORT

A female baby with multiple congenital anomalies was born by normal vaginal delivery in hospital. The mother's age was 20 years, and she had no antenatal ultrasonography. The birth weight of the baby was 2.2 Kg. The baby's head was attached to the placenta, which was delivered along with the baby (Figure 1a). The baby also had cleft lip and palate, abnormal development of the right eye and syndactyly in the right hand. The spine was normal. The genitalia and anal openings were normal. There was no obvious cardiac anomaly on clinical

examination; however echocardiography was not done as the facility for the same was not available.



Figure 1a Showing baby's head attached to the placenta

Address for correspondence:

*Retired Professor of Pediatric Surgery
Formerly Principal, Tezpur Medical College, Tezpur, Assam
Residence: House No. 23, Lachit Barphukan Path, Dakhingaon, Kahilipara
Guwahati-781019, Assam, India
Email: nirmalbhattacharya1951@gmail.com
Mobile: +919706057697

Cite this article as: Bhattacharyya Nirmal C. Acrania with placental adhesion: a case report. *Int J Health Res Medico Leg Prae* 2018 July;4(2):96-98. DOI 10.31741/ijhrmlp.v4.i2.2018.23

The baby was immediately taken up for surgery as it was observed that because of establishment of vascular connections between the placental vessels and the meningeal vessels, there was continuous blood loss through the placenta. After the vascular connections were ligated and divided, it was observed that the brain was exposed and protruding through a large deficiency in the skull and was devoid of any covering (**Figure 1b**). Since it was not possible to raise a skin flap to cover the very large defect in the skull, amniotic membrane was taken for covering the exposed brain tissue as a biological dressing, which was then covered with wet dressing. The baby was kept on antibiotics and intravenous nutrition. However, from the second day onwards the baby accepted breast feeding. The dressing was opened on the fifth day and it was found that the amniotic membrane has provided a temporary, but good biological cover for the exposed brain (**Figure 1c**).



Figure 1b Exposed brain tissue after separation of the placenta



Figure 1c Amniotic membrane providing a temporary cover for the exposed brain

CT scan with 3D imaging of the head done in the post operative period revealed acrania (**Figure 2a**). It also showed significant development of the brain with gross hydrocephalus with most of the brain tissue not covered by skull or soft tissue (**Figure 2b**), and multiple facial and orbital deformities (**Figure 2c**). The baby survived for 35 days and then expired due to sepsis.

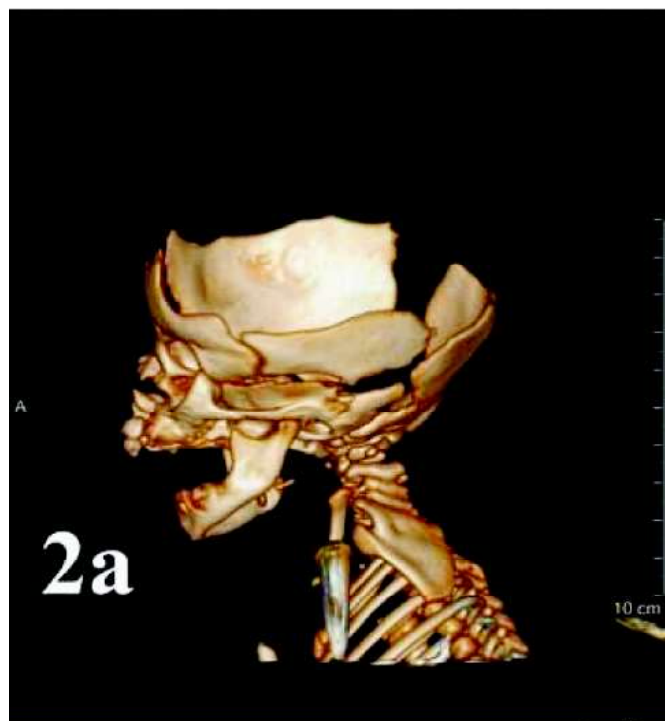


Figure 2a CT scan with 3D imaging showing acrania

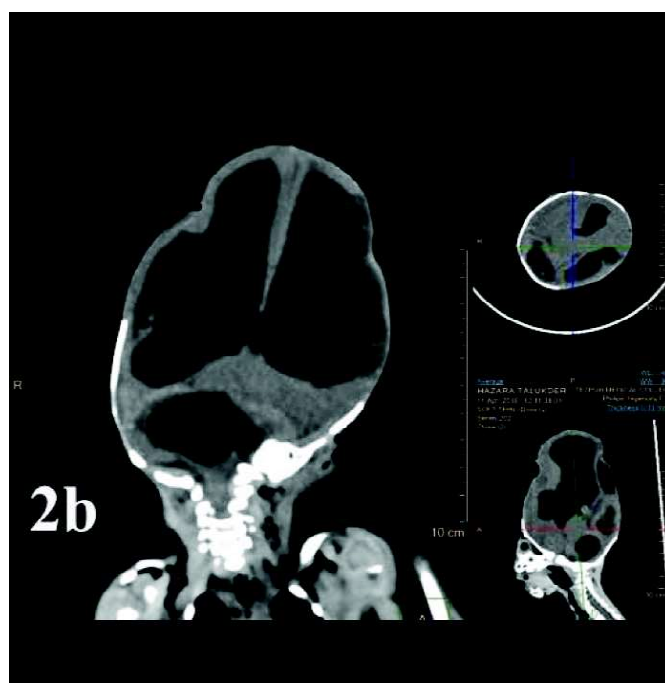


Figure 2b CT scan showing development of the brain with gross hydrocephalus

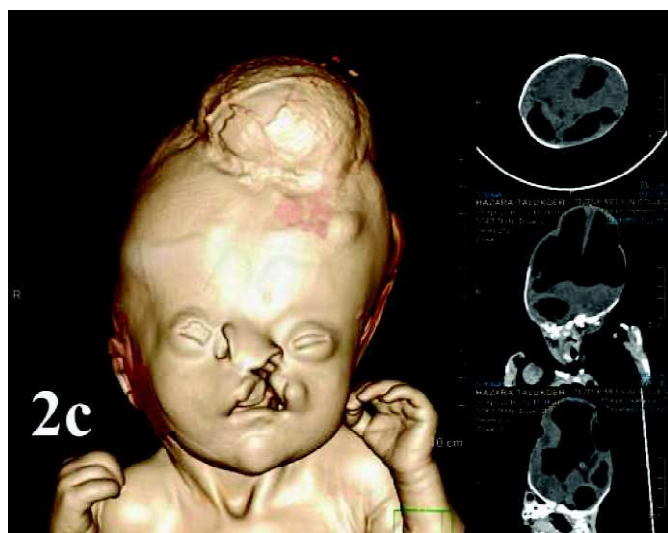


Figure 2c CT scan with 3D imaging showing cranial, facial and orbital deformities

DISCUSSION

Acrania can be diagnosed early in pregnancy during antenatal ultrasonography. Absence of a large part of the skull is diagnostic. Unlike anencephaly there is almost complete development of the brain tissue, which is directly exposed to the exterior. The exposed neural tissue during the early fetal period leads to adhesion with the placental tissue, the later being very vascular. As a result of this event taking place early in the fetal period, there may be establishment of vascular connections between the placental vessels and the meningeal vessels, leading to loss of blood after delivery through the placental vessels. This was observed in our case, which prompted us to take up the newborn baby for emergency surgery.

Anencephaly is a term which is defined as congenital absence of a major portion of the brain, skull, and scalp. The Centers for Disease Control estimates the incidence of anencephaly to be 0.3 per 1000 births.³ Anencephaly with placental attachment had been reported earlier but with survival for a very brief period.^{4,5} The exact incidence of acrania with placental attachment is not known, but must be extremely rare. The difference between anencephaly and acrania is merely the degree to which the brain tissue has developed. This case had almost fully developed brain tissue protruding through the skull defect, and hence may not qualify for the diagnosis of anencephaly. But the author feels that such differentiation of terminology may be only of academic interest.

Our case had multiple other defects like facial cleft and limb deformity. The cases reported earlier by Bisht et al⁴ and Sasidharan et al⁵ were similar to our case, although reported

as anencephaly. Our case had no skin cover over the brain, which explains the intra-uterine placental adhesion with the exposed brain. Moreover the brain in our case was developed, although it had abnormal structure as was seen in the CT image. CT scan with 3D imaging in the postnatal period is very helpful in assessing the deficiency of skull bone, and this establishes the diagnosis of acrania. Embryogenesis of this anomaly is not well understood. Amniotic band encircling the developing brain during the early fetal period had been cited as a probable cause of this anomaly.⁶

Prolonged survival of such cases is not reported in literature. Most cases are aborted during early pregnancy or are stillborn. Separation of the placenta from the cerebral surface after careful ligation of the connecting vessels followed by amniotic membrane coverage of the exposed brain tissue in this case led to survival of the baby for 35 days.

CONCLUSION

Acrania with placental adhesion is a rare anomaly. Survival of such a case with multiple anomalies of face and limb for 35 days is reported. This is probably the longest reported survival of a case with such anomalies.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

Acknowledgement: The author is grateful to the Tezpur Medical College and Hospital authority for the permission to report this case.

Consent: Taken from parent for the publication of photos and other informations of the baby for academic use.

REFERENCES

1. Kwon T, King J, Jeanty P. Acrania: review of 13 cases. [cited 2018 Feb 10]; Available from: URL: <http://www.thefetus.net/1991-01-01-12>.
2. Mannes EJ, Crelin ES, Hobbins JC, et al: Sonographic demonstration of fetal acrania. *AJR* 1982;139:181.
3. Centers for Disease Control. Congenital malformations surveillance. January 1982—December 1985. Washington, D.C.: Department of Health and Human Services, 1988.
4. Bisht S, Arya S, Chellani H. Placental Adhesion on an Anencephalic Head of a Newborn. *Pediatric Oncall* [serial online] 2015 [cited 2015 July-September 1];12. Art #49. Available From: URL: <http://www.pediatriconcall.com>
5. Sasidharan CK, Anoop P. Anencephaly with placental attachment. *Indian J Pediatr* 2002;69:991-992.
6. Merrimen JL, McNeely PD, Bendor-Samuel RL, Schmidt MH, Fraser RB. Congenital placental-cerebral adhesion: an unusual case of amniotic band sequence. *J Neurosurg* 2006;104(5 Suppl):352-355.

CASE REPORT

A synonym to healing for perforation repair-MTA

Shekhawat Krutika¹, Bora Proxima², Kataki Rubi³, Bhuyan AC⁴

Received on November 30, 2018; editorial approval on January 30, 2018

ABSTRACT

Root perforation is an iatrogenic communication between the root canal systems to the supporting tissues of teeth. Often, it is an accidental result of misaligned use of rotary burs during access preparation and location of root canal orifices. Other possible etiologic factors for perforation can be strip perforations during cleaning and shaping procedures, root resorption, defect created during post space preparation, perforation of floor of pulp chamber due to extension of carious lesion. The present case report throws light on the healing of rarefaction of the furcation area caused due to accidental perforation due to access cavity preparation. Endodontic treatment with placement of MTA as perforation repair material. Many materials have been reported as furcation repair materials but in the present case report MTA is used as a repair material which achieved excellent results. Mineral trioxide aggregate is a suitable material for the treatment of root perforations, with the goal of regenerating periodontal attachment.

Keywords: *Iatrogenic furcal perforation, Radiolucency, periodontal attachment*

INTRODUCTION

Mineral trioxide aggregate (MTA) has been regarded as an ideal material for perforation repair, retrograde filling, pulp capping, and apexification since its introduction in 1993.^{1,2} With longer duration, new cementum was found on the surface of the material.³ Regardless of the cause, a perforation allows bacterial invasion into the supporting structures that initially incites inflammation and loss of attachment, which eventually may compromise the prognosis of the tooth.^{4,5} Furcation perforation is followed by bacterial contamination, periradicular tissue injury, inflammation, bone resorption, periodontal fiber destruction, epithelium proliferation, and periodontal pocket development.⁶ A principle goal of endodontic therapy is to remove bacteria and seal the root canal to promote osseous regeneration.⁷ Several studies have demonstrated that perforation of the root surface complicates

our ability to achieve this goal.^{4,6} The aim of this long-term follow-up case report is to present a successful treatment of iatrogenic furcal perforation by MTA.

CASE REPORT ONE

A 22 year old male patient reported to the department of Conservative Dentistry and Endodontics, Regional dental college, Guwahati. Patient complained of pain and swelling in right lower region of jaw. On clinical examination: extraorally fluctuant swelling was present in mandibular region. Intraorally temporary dressing was seen with 46 and restoration with 45. On radiographic examination incomplete obturation was found with respect to 45 and radiolucency was seen in bifurcation area 46. Local anaesthesia was applied and rubber dam placed. Temporary dressing was removed with 46 and which was followed with profuse haemorrhage. After copious irrigation with 3% sodium hypochlorite haemorrhage was controlled and furcal perforation was detected. Canals were then located. The perforation was sealed with mineral trioxide aggregate, ProRoot MTA (Dental Tulsa; Dentsply) mixed in a 3:1 proportion. In this appointment, MTA was applied with MTA carrier, a moist cotton pellet was then placed in the pulp chamber to produce a humid ambient for MTA with the aim of achieving its solidification, and the tooth was temporarily filled with Cavit. In the next appointment the working lengths were determined both electronically and radiographically. The mesial and distal canals were cleaned and shaped using Protaper (Dentsply Maillefer, Ballaigues, Switzerland) in a crown-down technique and copious irrigation with 5.25% sodium hypochlorite. Calcium hydroxide was placed as an intra canal medicament for 2

Address for correspondence:

¹Post Graduate Student (PGT) (Corresponding author)

Email: shekhawatkrutika@gmail.com

Mobile: +919954232356

²PGT, ³Professor, ⁴Professor and head cum Vice Principal
Department of Conservative Dentistry & Endodontics,
Regional Dental College, Guwahati

Cite this article as: Shekhawat Krutika, Bora Proxima, Kataki Rubi, Bhuyan AC. A synonym to healing for perforation repair-MTA. *Int J Health Res Medico Leg Prae* 2018 July;4(2):99-101. DOI 10.31741/ijhrmlp.v4.i2.2018.24

weeks. After which the root canals were obturated with gutta-percha points and AH26 sealer. Simultaneously retreatment procedure was also performed with respect to 45. Patient was recalled after a week for regular check up. Patient was asymptomatic at 1 week recall. Then a follow up was done at 3, 6, 9 months which showed complete healing of the large bifurcation radiolucency.

CASE REPORT TWO

A 20 year old girl came to the Department Of Conservative Dentistry And Endodontics, Regional Dental College, Guwahati, Assam with the chief complaint of incomplete root canal treatment with anterior tooth. On examination temporary dressing was found with respect to 11. Local anaesthesia was administered followed by placement of rubber dam. On removal of dressing profuse bleeding was observed with 11. Bleeding was controlled with copious use of sodium hypochlorite and labial perforation was detected both clinically and radiographically. Working length was determined and biomechanical preparation was done and the tooth was obturated till the site of perforation with lateral condensation technique. MTA was placed over the perforation site and remaining pulp chamber was sealed with composite restorative material. During follow up after 1 week patient was found to be asymptomatic and no pathology was seen both radiographically and clinically at 3, 6, 9 months follow up.

DISCUSSION

Effective seal of root perforation is essential for prognosis of perforated teeth which would have been rather compromised. The first case report was that of accidental perforation during access cavity preparation where as second case presented with incomplete root canal treatment along with labial perforation defect. Two cases presented here were effectively sealed with MTA, which depicted favourable results as patients were asymptomatic after follow up visits. Radiographs revealed complete osseous healing.

In the past years, amalgam, composite resin and glass ionomer cements have been used for sealing furcal perforation. However, studies have shown that MTA is apparently superior to these materials with respect to marginal adaptation^{8,9,10-12}, bacterial leakage^{8,9,10-13} and cytotoxicity.^{8,14} MTA is a biocompatible material which when used in root-end cavities, stimulates reparation of periradicular tissues, showed no inflammation and deposition of cementum¹⁵ and the ability to induce hard tissue formation.¹⁶

Studies have shown that MTA actively promotes hard-tissue formation rather than being inert or an irritant like other materials^{17,18}. The clinical applications also have proved that MTA is suitable for solving the problems derived from perforation. It does not interfere with the presence of moisture, and it inhibits the activity of bacteria.^{19,20,21,22}

CONCLUSION

Mineral trioxide aggregate is a suitable material for the treatment of root perforations, with the goal of regenerating periodontal attachment. In the above case reports, root

perforations were treated with MTA to seal the perforation site. The repaired teeth were clinically and radiographically healthy and continued to satisfy esthetic and functional demands. Based on the outcome of the cases presented, MTA is a good material for the repair of the perforation and has been proven effective for large perforations and those close to the coronal third of the root.

Though favourable results have been achieved in the above mentioned case reports but long term follow up studies need to be conducted.

Case 1



Figure1 MTA placed in furcation area



Figure 2 Working length determination



Figure 3 Post-operative follow up after 9 months

Case 2

Figure 1 Perforation on labial surface of central incisor



Figure 2 Post operative follow up with placement of mta (9 months)

REFERENCES

1. Lee SJ, Monsef M, Torabinejad M. Sealing ability of a mineral trioxide aggregate for repair of lateral root perforations. *J Endod* 1993;19:541-544.
2. Osorio RM, Hefti A, Vertucci FJ, Shawley AL. Cytotoxicity of endodontic materials. *J Endod* 1998;24:91-96.
3. Qiang Zhu, Robert Haglund, Kamran E. Safavi, Larg S. W. Spanberg : Adhesion of Human Osteoblasts on Root-End Filling Materials. *J Endod* 2000;27:404-406.
4. Ruddle CJ. Nonsurgical Endodontic Retreatment. In: Cohen S, Burns RC (eds). *Pathways of the pulp*, 8th ed. St Louis: Mosby Inc; 2002. p. 917.
5. Sinai IH. Endodontic perforations: their prognosis and treatment. *J Am Dent Assoc* 1977;95:90-5.
6. Seltzer S, Sinai I, August D. Periodontal effects of root perforations before and during endodontic procedures. *J Dent Res* 1970;49:332-9.
7. Hirsch JM, Ahlstrom U, Henrikson PA, Heyden G, Peterson LE. Periapical surgery. *Int J Oral Surg* 1979;8:173-85.
8. Torabinejad M, Hong CU, Lee SJ, Monsef M, Pitt Ford TR. Investigation of mineral trioxide aggregate for root-filling in dogs. *J Endod* 1995;21:603-608.
9. Torabinejad M, Pitt Ford TR. Root-end filling materials: a review. *Endod Dent Traumatol* 1996;12:161-178.
10. Torabinejad M, Pitt Ford TR, McKendry DJ, Abedi HR, Miller A, Kariyawasam SP. Histologic assessment of mineral trioxide aggregate as a root-end filling in monkeys. *J Endod* 1997;23:225-228.
11. Wu M, Kontakiotis EG, Wesselink PR. Long-term seal provided by some root-end filling materials. *J Endod* 1998;24:557-560.
12. Shabahang S, Torabinejad M, Boyne PP, Abedi H, McMillan P. A comparative study of root-end induction using osteogenic protein-1, calcium hydroxide and mineral trioxide aggregate in dogs. *J Endod* 1999;25:1-5.
13. Bates CF, Carners DL, Del Rio CE. Longitudinal sealing ability of MTA as a root-end filling material. *J Endod* 1996;22:575-578.
14. Keiser K, Johnson C, Tipton DA. Cytotoxicity of MTA using human periodontal ligament fibroblasts. *J Endod* 2000;26:288-289.
15. Holland R, Filho JA, De Souza V, Nery MJ, Bernabe PF, Junior ED. Mineral trioxide aggregate repair of lateral root perforations. *J Endod* 2001;1:281-284.
16. Yaltirik M, Ozbas H, Bilgic B, Issever H. Reactions of connective tissue to mineral trioxide aggregate and amalgam. *J Endod* 2004;30:95-99.
17. Holland R, Otoboni Filho JA, De Souza V, Nery MJ, Bernabe PF, Dezan E. Mineral trioxide aggregate repair of lateral root perforations. *J Endod* 2001;27:281-4.
18. Torabinejad M, Pitt Ford TR, McKendry DJ, Abedi HR, Miller DA, Kariyawasam SP. Histologic assessment of mineral trioxide aggregate as a root-end filling in monkeys. *J Endod* 1997;23:225-8.
19. Menezes R, da Silva Neto UX, Carneiro E, Letra A, Bramante CM, Bernadinelli N. MTA repair of a supracrestal perforation: a case report. *J Endod* 2005;31:212-4.
20. Arens DE, Torabinejad M. Repair of furcal perforations with mineral trioxide aggregate- two case reports. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996;82:84-8.
21. Hsien HC, Cheng YA, Lee YL, Lan WH, Lin CP. Repair of perforating internal resorption with mineral trioxide aggregate: a case report. *J Endod* 2003;29:538-9.
22. Main C, Mirzayan N, Shabahang S, Torabinejad M. Repair of root perforations using mineral trioxide aggregate: a long term study. *J Endod* 2004;30:80-3.

CASE REPORT

Candida parapsilosis infection in a non-healing skin ulcer

Das Angshurekha¹, Barua Purnima², Patir Jayanta³, Shivaprakash RM⁴

Received on March 26, 2018; editorial approval on May 24, 2018

ABSTRACT

Candida parapsilosis is an emerging major human pathogen that has dramatically increased in significance and prevalence over the past two decades, such that *C. parapsilosis* is now one of the leading causes of invasive candidal disease. It has also become a significant cause of sepsis, wound and tissue infection in immune-compromised individuals such as AIDS patients and surgical patients, particularly those having surgery of the gastrointestinal tract, are at high risk for infection with *C. parapsilosis*. Unlike other species of *Candida*, *C. parapsilosis* is not an obligate human pathogen and has been isolated from a variety of non-human sources. Here we report a case of non-healing skin ulcer caused by *Candida parapsilosis* in a patient of chronic hepatitis.

Keywords: Nasal ulcer; hepatitis, blastoconidia, pseudohyphae

INTRODUCTION

Candida parapsilosis is an emerging major human pathogen that has dramatically increased in significance and prevalence over this past two decades such that *Candida parapsilosis* is now one of the leading causes of invasive candidal disease.¹ *C. parapsilosis* is also normal human commensal and it is one of the fungi most frequently isolated from the human hands. There are several risk factors which can help *Candida parapsilosis* to colonize human host. It has also become a significant cause of sepsis, wound and tissue infection in immunocompromised individual such as AIDS patients and surgical patients, particularly those having surgery of gastrointestinal tract are at high risk for infection with *C. parapsilosis*. Unlike other species of *Candida*, *C. parapsilosis* is not an obligate human pathogen and has been isolated from a majority of non-human sources. Here we report a case of non-healing ulcer where *C. parapsilosis* was isolated.

CASE REPORT

A 45 year old female visited dermatology OPD with a small superficial ulcer on the nose which was two months old (Figure 1). She revealed that the ulcer started as a small papule

then a vesicle which broke off to form an open ulcer. On inspection a solitary circular ulcer was seen just above the ala of the left nostril. The size was around 2.5 × 2.5 cm. The edge of the ulcer was inflamed, edematous and punched out. Margin was regular. The floor of the ulcer was covered with red granulation tissue and the depth was around 3–4 mm. There was serous discharge from the ulcer. The surrounding area of the ulcer was glossy, red and edematous. On palpation it was tender and slight induration at the base of the ulcer was present. She was advised topical antibiotics and regular dressing with antiseptics. After this initial treatment she revisited the OPD after four weeks but the ulcer did not heal. Then a culture and sensitivity was done where there was no bacterial growth. She was advised to take broad spectrum antibiotics orally and ointments to apply locally. She also complained of generalised weakness, anorexia and sometimes mild abdominal discomfort for which she was referred to Medicine OPD. There she was examined carefully and no significant signs were found. She was advised to do routine examination of blood and urine, liver function test and an ultrasonography. Significant findings revealed haemoglobin as 8 gm % and the WBC count as 11000 c/mm. Liver function test showed raised levels of SGOT as 280 I.U. and SGPT as 300 I.U. and total bilirubin level was 2mg/dL. Since all the levels were elevated she was advised to do test for viral hepatitis. On testing it was found that she was

Address for correspondence:

¹Assistant Professor (Corresponding author)

Email: drangshurekha@gmail.com

Mobile: +919435110402

²Associate Professor

Department of Microbiology

Jorhat Medical College and Hospital, Jorhat, Assam, India

Email: drpurnimabarua@gmail.com

Mobile: +919435141989

³Pathologist, Prime Laboratory, Jorhat, Assam,

⁴Professor, PGT of Medical Education and Research, Chandigarh, India

Cite this article as: Das Angshurekha, Barua Purnima, Patir Jayanta, Shivaprakash RM. *Candida parapsilosis* infection in a non-healing skin ulcer. *Int J Health Res Medico Leg Prae* 2018 July;4(2): 102-104. DOI 10.31741/ijhrmlp.v4.i2.2018.25

positive for antibody against Hepatitis C virus. To detect the activity of the virus, a viral load of HCV was done where the level was 8,00,000 IU/ml. Since then she was put on antiviral drugs. But the ulcer did not show signs of healing with antibiotics. Then a FNAC was advised from the nasal ulcer and the findings revealed numerous budding yeast cells along with polymorphs, lymphocytes and histiocytes with scattered benign squamous cells (Figure 2). Subsequently a fungal culture was done from scrapings collected from the edge of the ulcer. On Sabouraud Dextrose agar colonies were cream coloured, smooth, pasty, glabrous and convex yeast like in appearance after 72 hrs of incubation at room temperature. The microscopic morphology shows predominantly small, globose to ovoid budding yeast like cells or blastoconidia, approximately $2-3 \times 3-4 \mu\text{m}$ in size with some larger elongated forms present. A germ tube test was done which came out to be negative indicating a non albicans group. On cornmeal and Tween 80 agar abundant, much branched pseudohyphae in a delicate tree like pattern with 2-3 blastoconidia in small clusters at intervals along the pseudohyphae or radiating from the pseudohyphae was observed (Figure 3). The isolate was sent to the National Culture Collection of Pathogenic Fungi, Post Graduate Institute of Medical Education and Research, Chandigarh for species identification and confirmation. Matrix-assisted Laser Desorption Ionization-time of Flight Mass Spectrometry (MALDI-ToF MS) identification methods has been adopted for the rapid identification of the yeast colony. The protein spectra was read in the MALDI-TOF (Bruker) and the data was analysed using Flex analysis software (provided by the manufacturer) where the isolate was confirmed to be *Candida parapsilosis*. To rule out contamination, a repeat sample was taken from the ulcer after one week and was subjected to histopathological examination and fungal culture. Similar type of colonial growth was seen and HPE revealed budding yeast cells among granulation tissue.



Figure 1 Superficial ulcer on the nose

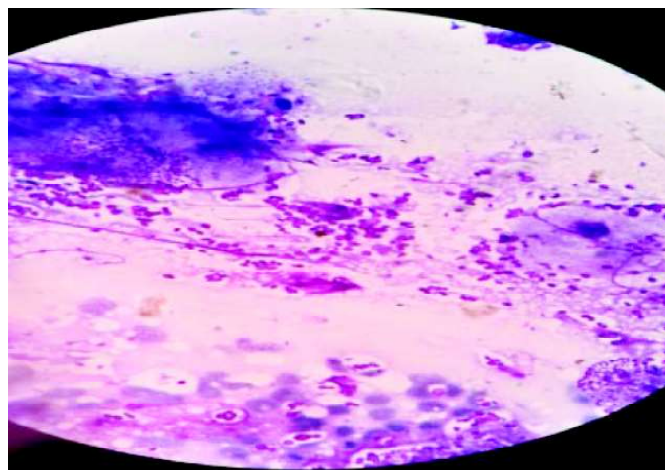


Figure 2 Smear with Giemsa stain



Figure 3 40x magnification shows *C parapsilosis*

Antifungal susceptibility test was done according to CLSI guidelines where the isolate was sensitive to Itraconazole, Amphotericin B, Fluconazole and resistant to Flucytosine. The patient was prescribed Fluconazole, 150mg, once weekly for four weeks and Terbinafine ointment to apply locally but she did not return for follow up.

DISCUSSION

Recently an increasing number of publications have described populations with increased incidence of diseases associated with *Candida parapsilosis* and have attributed various risk as predisposing factor for infection. There are many differences in the results reported about *Candida parapsilosis*, as the populations, the number of patients included and the geographical locations of the hospitals are widely diverse. A study in Barcelona with invasive *C parapsilosis* identified risk factors that included vascular catheterization (97%), prior antibiotic therapy (91%), parenteral nutrition (54%), prior surgery (46%), prior immunosuppressive therapy (38%), malignancy (27%), Transplant recipient (16%), neutropenia (12%) and prior

colonization (11%).² In other studies, infection with *C parapsilosis* has been especially associated with hyperalimentation solutions/parenteral nutrition, intravascular pressure monitoring devices, ophthalmic irrigating solution, antibiotic overuse, prematurity and central venous catheterization.³ Colonization of the skin or gastrointestinal tract is a frequent first step in the pathogenesis of invasive candida disease. Very few reports of *Candida parapsilosis* implicated in non-healing ulcer are available. Although *C parapsilosis* is a normal human commensal and it is one of the fungi most frequently isolated from the subungual space of human hands, so its pathogenicity is limited by intact integument. English et al reported that *C parapsilosis* was frequently isolated from the venous leg ulcers of patients, although its pathogenic role in these cases was suggested evidences indicated nosocomial transmission.⁴ Facial and pubic folliculitis due to *C parapsilosis* has also been reported where its role as a pathogen cannot be overlooked.⁵

CONCLUSION

Here in this report, repeated isolation of *C parapsilosis* only with no other significant pathogen, signifies its colonization as a pathogen rather than a bystander. It is perhaps the first ever case reported from North East where *C parapsilosis* was isolated from a solitary ulcer. Moreover, its association with clinical diseases other than HIV/AIDS or any metabolic disorder clearly signifies the emerging pathogenicity pattern of the yeast and its constant association with any conditions in immune compromised individuals.

Conflict of interest: No conflict of interest.

Ethical clearance: Obtained.

Consent of the patient: Both verbal and written consent was obtained from the patient.

Contribution of authors: “We declare that this work was done by the authors named in this case report with equal contributions.”

REFERENCE

1. Trofa D, Gascier A, Nosanchuk D. *Candida parapsilosis* an emerging fungal pathogen. Clin Microbiol Rev 2008 Oct;21(4):606-625.
2. Almirante B, Rodriguez D, Cuenca-Estrella M, Almela M, Sanchez F, Ayats J, Alonso-Tarres C, Rodriguez-Tudela JL, Pahisa A. Epidemiology, risk factors and prognosis of *Candida parapsilosis* bloodstream infections: case-control population-based surveillance study of patients in Barcelona, Spain, from 2002 to 2003. J Clin Microbiol 2006 May;44(5):1681-1685.
3. Girmenia C, Martino P, Bernardis DF, Gentile G, Bocanera M, Monaco M, Antonucci G, Cassone A. Rising incidence of *Candida parapsilosis* fungemia in patients with haematologic malignancies: clinical aspects, predisposing factors, and differential pathogenicity of the causative strains. Clin Infect Dis 1996 Sept;23:506-514.
4. English MP, Smith RJ, Harman RRM. The fungal flora of ulcerated legs. Br J Dermatol 1971;84(6):567-581.
5. Yu-ning L, Jian-qiang S, Wen-ming H. Folliculitis caused by *Candida parapsilosis*. Int J Dermatol 1988;27:522-3.

CASE REPORT

An unusual case of cardiac tamponade due to rupture of ascending aorta in a young adult

DebBarma Antara¹, Yadav Abhishek², Kanwar HK³, Dey Arjit⁴, Gupta SK⁵

Received on March 01, 2018; editorial approval on June 07, 2018

ABSTRACT

Cardiovascular Diseases (CVD) are very prevalent in India and above 20 years, the estimated prevalence is 3-4% in rural and 8-10% in urban. The most common cause of sudden cardiac death among young adults is hypertrophic cardiomyopathy followed by coronary artery anomalies. We report one case of sudden cardiac death due to cardiac tamponade consequent upon ruptured ascending aorta in a young adult male. The deceased had left ventricular hypertrophy suggesting the presence of chronic hypertension. He did not have any previous complaints prior to his death, any history of genetic disorder and particularly no family history of hypertension in the family. The interview with the relatives revealed that the deceased used to do regular gymnasium exercise and might have been using muscle building protein supplements. This can be considered as a predisposing factor for his pathological Heart condition and untimely death. The authors want to highlight the importance of regular health check-up for cardiac diseases even in unsuspecting healthy individuals.

Keywords: Hemopericardium, Hypertrophic Cardiomyopathy, Hypertension

INTRODUCTION

Cardiovascular diseases (CVD) are very prevalent in India and above 20 years, the estimated prevalence is 3-4% in rural and 8-10% in urban.¹ The cardiac causes are the most common causes of sudden death.² Sudden cardiac deaths are getting frequently reported in young adults in Medical Literature. Such untimely and unexpected deaths are not only a great emotional loss to family members but also to a Nation's productivity. The most common causes of sudden cardiac death among young adults, in descending order of frequency, are hypertrophic cardiomyopathy, coronary artery anomalies with an inter-arterial or intramural course, and arrhythmogenic right ventricular cardiomyopathy (ARVC).^{3,4} Health

professionals spread awareness about the importance of cardiac health and recommends regular health checkups, but still this aspect is very often being overlooked by the people particularly in the young age groups and the risk continues to rise in Indian Population.¹ We report one unusual case of sudden cardiac death in a healthy youth due to ruptured ascending aorta leading to Hemopericardium (HP) cardiac tamponade (CT).

CASE HISTORY

The deceased was a young adult male of 25 years and belonged to an affluent family with a rich modern life style. On the day of the incident, he went along with a group of his friends to watch movie in a multiplex movie theatre. There he sat comfortably inside the hall at his allotted seat, but soon after his friends found him in an unconscious condition in his seat. They rushed him to a hospital, where he was declared brought dead. The dead body of the deceased was then brought to the Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi for post mortem examination. There was no history of any significant illness nor did his friends report any complaints previous to his death.

AUTOPSY FINDINGS

The deceased was of heavy and muscular built. Face was congested. No external injuries were present over the body on external examination.

Lungs were edematous and congested. Brain was congested and edematous. On opening the pericardial sac, about 300 ml

Address for correspondence:

¹Senior Resident (**Corresponding author**)

Email: antaradebbarma@gmail.com

Mobile: +919205623401

²Assistant Professor, ^{3,4}Senior Resident, ⁵Professor & Head
Department of Forensic Medicine and Toxicology
AIIMS, New Delhi-110029

Cite this article as: Deb Barma Antara, Yadav Abhishek, Kanwar HK, Dey Arjit, Gupta SK. An unusual case of cardiac tamponade due to rupture of ascending aorta in a young adult. *Int J Health Res Medico Leg Prae* 2018 July;4(2):105-107. DOI 10.31741/ijhrmlp.v4.i2.2018.26

of liquid and clotted blood was present in pericardial cavity and was partially organized over the ventricles (**Figure 1**).



Figure 1 Liquid and Clotted blood present in Pericardial Cavity Heart was enlarged weighing 440 gms. Left ventricle hypertrophy was present with a thickness of 2.4cm (**Figure 2**).

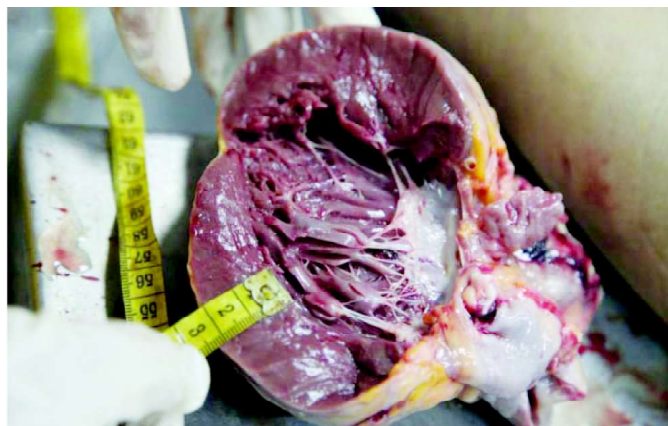


Figure 2 Left Ventricular hypertrophy

Rupture was present in Postero-lateral wall of ascending aorta just away from its origin (**Figure3**). Hyperemic area was present around the rupture site. Multiple petechiae were present over the Epicardial surface of the ventricles.

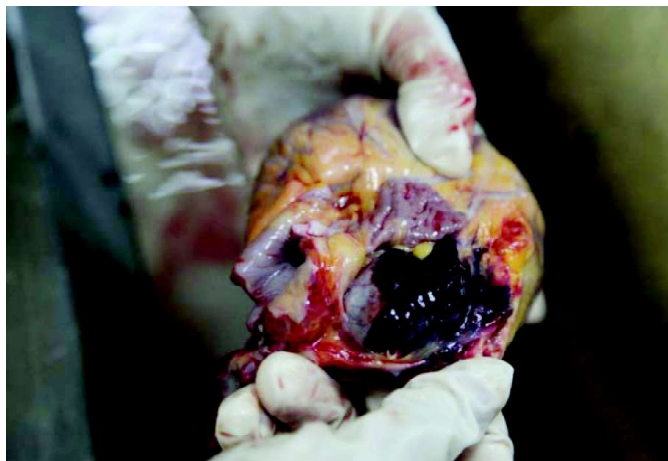


Figure 3 Tear in the Postero-lateral wall of Ascending Aorta

Stomach contained about 50 ml semi-digested yellowish fluid with no specific smell and normal mucosal walls. Liver, spleen, and Kidneys were congested. No abnormality was detected in the Pelvic cavity, Pelvic bones and Bladder.

HISTOPATHOLOGICAL EXAMINATION

HPE examination showed infiltration of the neutrophils in the ruptured site, suggesting of antemortem tear. No changes were seen in the left ventricular wall. On HPE of lungs, pulmonary macrophages were present, which suggested of heart failure.

TOXICOLOGICAL ANALYSIS REPORT

Toxicological analysis report came negative for all common poisons and alcohol.

DISCUSSION

Hemopericardium (HP), which is filling of blood in the pericardial cavity leads to the clinical state of cardiac tamponade (CT)⁵ which is fatal enough to cause sudden death in undiagnosed conditions. The volume of blood necessary to produce CT may be about 200 ml in cases where rupture is bigger and there is sudden and rapid leakage of blood into the pericardium or may be greater than 2000ml in cases where rupture is smaller and there is slow leakage of blood into the pericardium. The filling of blood limits the expanding of heart in diastole. This leads to incomplete filling of ventricles and great vessels ultimately resulting in low stroke volume^{5,6} and causing sudden death. In our case there was 300 ml of blood in the pericardial cavity which is sufficient to cause sudden death of the deceased.

HP following trauma to the chest develop due to tear in the ventricles, rupture of ascending aorta, pericardial vessel or coronary artery.^{5,7,8} In non-traumatic causes, Swaminathan reported that incidence of HP due to the rupture of acute MI to be the most common (69% cases).⁹ In non-arrhythmic complications of MI ventricular wall rupture is second most common cause of death, first being cardiogenic shock.¹⁰ Though the rupture of the heart is the most common cause of HP leading to CT⁶, but, in our case, we have diagnosed a rare case of CT due to ruptured ascending aorta. The histopathological findings of the lungs further confirmed consequent Heart failure. CT may develop rapidly and leads to sudden death or it may develop slowly with the clinical symptoms resembling heart failure like dyspnea, orthopnea and hepatic engorgement⁵ The diagnosis is confirmed by Beck's triad i.e. hypotension, soft or absent heart sounds and Jugular venous distension with a prominent X descent but an absent Y descent. Paradoxical pulse is a vital clue to the diagnosis of CT.³ Echocardiography further confirms the diagnosis.¹¹

Detailed interview with the relatives revealed that there was no specific history of hypertension, genetic disorder in the family, any cardiac complaints or trauma prior to the incident. The deceased used to do regular gymnasium exercises and though the family members were not sure but they stated that he might have been possibly using protein or other muscle

enhancing supplements. The strenuous gymnasium exercises particularly for muscle building involves increased cardiac output and increased blood flow into the arterial system. This enhanced blood flow can cause continuous damage to the intima of aorta and predisposing it for rupture. Moreover, the deceased had findings consistent with hypertension i.e. left ventricular hypertrophy and enlargement of heart, which also leads to high cardiac output. Various studies in the past have also advocated for screening of young individuals particularly those involved in athletics and exercise.^{12,13} Such screenings have identified the young athletes with increased risk of cardiovascular diseases thereby decreasing incidence of sudden deaths.^{14,15}

CONCLUSION

More and more of sudden cardiac death cases are being reported in young adults, giving a hint towards a luxury life style being the predisposing factor particularly junk foods, alcohol abuse, smoking, stress factor, lack of daily exercise or unsupervised heavy exercise.. The protein or muscle building supplements should be taken only under Medical supervision and regular health checkups should be done in such cases. The Forensic pathologist should take into consideration the natural causes of Hemopericardium by considering the factors like history of past illness/genetic disorder or absence of injuries

ABBREVIATIONS

CVD-Cardiovascular Disease

CT – Cardiac Tamponade

HP – Haemopericardium

MI –Myocardial Infarction

Acknowledgements: Nil

Conflict of interests: None.

Source of funding: Self.

Ethical clearance: Not required.

REFERENCES

1. Ajay VS, Prabhakaran D. Coronary heart disease in Indians: Implications of the interheart study. *Indian J Med Res* 2010;132:561-66.
2. Libby P. The pathogenesis, prevention, and treatment of atherosclerosis. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J. *Harrison's principles of internal medicine*, vol-2, 18th ed. Chapter241. USA: The McGraw Hill; 2011.p. 1983.
3. Zipes DP, Camm AJ, Borggreffe M, Buxton AE et al. Guidelines for Management of Patients With Ventricular Arrhythmias and the Pre-vention of Sudden Cardiac Death: a report of the American College of Cardiology/ American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines. *Circulation* 2006;114(10):385–484.
4. Sen-Chowdhry S, McKenna WJ. Sudden cardiac death in the young: a strategy for prevention by tar-geted evaluation. *Cardiology* 2006;105(4):196–206.
5. Braunwald E. Pericardial Diseases. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J. *Harrison's Principles of Internal Medicine*, vol-2, 18thed. Chapter239. USA: The Mc Graw Hill; 1972. p. 74.
6. Knight B, Saukko P. *Knight's Forensic Pathology*, 3rd ed. London: Arnold; 2004. p.502.
7. Altuna G, Altunb A, Yilmaza A. Hemopericardium-Related Fatalities: A 10-Year Medicolegal Autopsy Experience. *Cardiology* 2005;104:133-7.
8. Mathur I, Bohra B, Sharma KD, Nag J, Saini OP, Q Fatima. Cardiac amponade: A Small case series. *JIAFM* 2011;33(3):277-9.
9. Swaminathan A, Kandaswamy K, Powari M, Mathew J. Dying from cardiac tamponade. *World Jr of Em Sur* 2007;2:22.
10. Prieto A, Eisenberg J, Thakur RK. Nonarrhythmic Complications of acute Myocardial Infarction. *Emerg Med Clin Nor Am*2001;19(2):397-415.
11. Figueras J, Cortadellas J, Soler-Soler J. Left ventricular free wall rupture: clinical presentation and management. *Heart [Internet]* 2000 [Cited 2015 Jan 07];83:499–504. Available From: URL:<http://heart.bmj.com/content/83/5/499.full>
12. Marek JC, Marek SA, Marek KA, Zimmerman F, Davis J.A novel approach to screening for sudden cardiac death in young adults utilizing a Stratified method with ECG and Echo. *JACC* 2010;55.
13. Asif IM, Drezner JA. Sudden cardiac death and pre-participation screening: the debate continues—in support of electrocardiogram-inclusive pre-participation screening. *Prog Cardiovasc Dis* 2012;54(5):445–50.
14. Corrado D, Basso C, Pavei A, Michieli P, Schiavon M, ThieneG.Trends in sudden cardiovascular death in young competitive athletesafter implementation of a pre-participation screening program. *JAMA*2006; 296:1593-1601.
15. Corrado D, Basso C, Schiavon M, Thiene G. Screening for hypertrophiccardiomyopathy in young athletes. *N Engl J Med* 1998;339:364-9.

CASE REPORT

Silicone finger prosthesis: bracing back the life

Trivedi Hina¹, Barman Jogeswar²

Received on April 30, 2018; editorial approval on May 01, 2018

ABSTRACT

Introduction: Rehabilitation of amputated finger is of utmost importance and the first choice is microvascular reconstruction. But whenever surgical reconstruction in patients is not possible contraindicated, unavailable, unsuccessful or unaffordable, the prosthetic rehabilitation is considered. It relieves the individual from the social stigma, while simultaneously improving their physical capability. **Aim:** This clinical report describes a method to fabricate silicone prosthesis for a patient who has a partial finger loss caused due to trauma. **Methods:** Prosthetic rehabilitation was done using room temperature vulcanizing silicone prosthesis to restore a non-functional esthetic finger. **Results:** Partial finger amputations can be successfully rehabilitated using silicone materials. **Conclusion:** Silicone prosthesis is truly capable of restoring the life like appearance of the lost body part although the function cannot be restored.

Keywords: Amputation, silicones, finger loss

INTRODUCTION

Amputation", derived from the Latin word "amputare" (to excise, to cut out) has been defined as the "removal of part or all of a body part enclosed by skin" (Dorland Medical Dictionary). There are various types of amputations such as self-amputation, congenital amputation or traumatic amputation. Finger and partial finger amputations are some of the most frequently encountered forms of partial hand losses.¹ The complete or partial loss of a finger results in significant functional deficiencies. In addition to immediate loss of grasp, strength and security, the absence of a finger may cause marked psychological trauma.² Hence rehabilitation of amputated finger is of utmost importance and the first choice for which is microvascular reconstruction. But when surgical reconstruction in patients is not possible contraindicated, unavailable, unsuccessful or unaffordable, the prosthetic rehabilitation becomes an alternative in order to improve the psychological status of an individual.³

Replacement of a missing finger by fabricating a prosthetic finger is a challenging task that requires great skill in terms of artistic and technical expertise.⁴ Various treatment modalities like implants, silicone elastomers, myoelectric replacements, 3-D printed prosthesis are currently in use for replacing missing finger. Over the years different materials have been tried and tested but acceptance rate for custom sculpted silicone elastomer has been exceptionally high due to its life like appearance.⁵

This case report describes rehabilitation of patient with partially missing finger using silicone elastomer.

Case report: A 27 year old male patient reported to the Department of Prosthodontics, Crown and Bridge, Regional Dental College, Guwahati with the complaint of a partially missing finger. The patient revealed history of a lost digit in a traumatic injury caused by a mechanical lathe ten years back. A complete examination of the hand revealed a residual stump approximately 3cm size terminating in the middle phalangeal region. The area around the residual stump was keratinized without any sign of inflammation.

METHODS

Impressions and pattern fabrication: The fabrication of the silicone finger prosthesis consisted of making an impression of the stump, followed by fabrication of wax pattern and laboratory procedures to obtain the silicone prosthesis.

Address for correspondence:

¹ PGT, Deptt of Prosthodontics (**Corresponding Author**)

Mobile: +918472824090

Email: trivedihina91@gmail.co

²Reader, Deptt of Prosthodontics

Regional Dental College

Bhangagarh, Guwahati, Assam

Mob: 7035706076

Email: barmandentust@gmail.com

PVS putty light body impression (3M ESPE Soft Putty Vinyl Poly Siloxane, 3M ESPE, Seefeld, Germany) is made of the amputated stump of the right index finger and the left normal hand. Stone replicas are made of the amputated finger.

Wax pattern (DPI Modeling Wax (Tropical Standard, DPI, Mumbai, India) is obtained by analogous finger technique, where moulding and sculpture on another persons' finger is performed and adapted on the stone replica of the residual stump. Additional surface anatomy peculiar to the patients' adjacent fingers is reproduced on the wax pattern.

This wax pattern was then seated in a flask with dental stone material covering it up to the sides. Markings were made on the cast to ensure the correct location of the stump. The undercut formed was to lock the stump to counter balance before flasking procedure. After applying separating medium (DPI) it was counter flaked and dewaxed **Figure 6**

Processing finger prosthesis

The finger stump was carefully separated without breaking mold. The finger stump was placed back in the mold, and complete closure of flask was again checked. The maxillofacial silicone (Copsil T 30 silicone resin and hardener) was mixed following manufacturer's instructions, avoiding incorporation of air bubbles. The mix was divided into two parts one for dorsal, and other for ventral portion of the finger. Shade matching was carried out by adding an appropriate ratio of intrinsic colors (Mp Sai biomed silicone prosthesis - set of five pigments) available with silicone material preferably under natural light. The obtained shade of mix was sequentially checked with patient's ventral and dorsal aspect of finger. Once satisfactory shade was obtained, packing of maxillofacial silicone material was done with respect to dorsal and ventral portions. The flask was closed under pressure and was left undisturbed for 4 hour for complete polymerization (room Temperature vulcanization of maxillofacial silicone. Deflasking was done, and finger prosthesis was carefully retrieved from stump and excess silicone were trimmed using sharp curved scissors. The fit and shade of the finger prosthesis were evaluated on the patient. The customized metal ring was used as an auxiliary



Figure 1 Defect



Figure 2 Silicone Finger Prosthesis : Palmer Surface



Figure 3 Silicone Finger Prosthesis : Dorsal Surface

aid of retention and also to mask prosthesis and skin junction. On completion of curing, the mould is removed. Prefabricated acrylic nails were attached with cyanoacrylate resin on the silicone nail bed.

DISCUSSION

Loss of finger affects esthetics and functionality, greatly impacting dexterity of an individual. Despite the advances in the microsurgical techniques, the reconstruction of the amputated digits for a number of patients may not be successful and they can better be restored with a passive prostheses.⁵ Over a period of time different materials like

polyurethane, PVC, acrylic resins have been tried but none can be compared to silicones in simulating the lost structures. A significant advantage of using this technique is the exact duplication of the anatomical and the fine surface details of the digits. This allows the surface characteristics of the prosthesis to be closely matched to that of the remaining digits of the hand.⁶

Multiple layers of clear silicone over each layer of color improves translucency and protects the coloration from environmental damage. The overall durability and stain resistance of silicone is far superior to any other material currently available for finger restorations. Almost all stains, including ballpoint ink, newsprint, clothing dyes, and food colorings can be removed easily with water and soap.⁷ Silicone finger restorations may have additional functional benefits. Many traumatic amputees experience painful hypersensitivity at the termination of finger remnants. The gentle, constant pressure of elastomer prosthesis can help desensitize and protect the injured tip.⁸ With the property of elasticity of silicone elastomer, it is possible to enhance retention further by scraping grooves into the positive model, creating separate vacuum chambers.⁹

CONCLUSION

For most patients, the aesthetic appearance of an amputated finger plays a more important role than function. With the advancement in skill, technology and materials available today, the rehabilitation of an amputated finger is no more aesthetically challenging. When fabricated with immense care, they can be made life- like. A well fabricated aesthetic prosthesis can help in providing the patients with psychological support.

Conflict of Interest: No conflict of interest associated with this work

Contribution of Authors: We declare that this work was done by Dr Hina Trivedi in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors mentioned in the article.

Ethical clearance: None required.

Source of funding: None.

REFERENCES

1. Pillet J. The aesthetic hand prosthesis. *Orthop Clin N Am* 1981;12:961–970.
2. Beasley RW. Hand and finger prosthesis. *J Hand Surg Am* 1987;12:144–147.
3. Pilley MJ, Quinton DN. Digital prosthesis for single finger amputation. *J Hand Surg Br* 1999;24(5):539–541.
4. Pillet J. Partial-hand amputation-aesthetic restoration. In: Bowker JH, Michael JW, editors. *Atlas of limb prosthetics: surgical, prosthetic and rehabilitation principles*. St. Louis: CV Mosby; 1992. p. 227–235.
5. Buckner H. Cosmetic hand prosthesis—a case report. *Orthot Prosthet* 1980;34(3):41–45.
6. Venkataswamy R. *Aesthetic prosthesis in hand injuries surgery of the injured hand*. New York: McGraw-Hill; 2010.
7. Michael JW, Buckner H. Options for finger prosthesis. *J Prosthet Orthot* 1994;6(1):10–19.
8. Livingstone DP. The D-Z stump protector. *Am J Occup Ther* 1988;42:185–187.
9. Herring HW, Romerdale EH. Prosthetic finger retention: a new approach. *Orthot Prosthet* 1983;37(2):28–30.

PUBLICATION ETHICS OF IJHRMLP

PUBLICATION ETHICS AND MALPRACTICE STATEMENT (PEMS)

Research scholars in respect to research and its subsequent publications are necessary to agree upon standards legal and ethical guidelines. Mastery and proficiency on the subject will help a medical writer in dealing with issues of scientific misconduct which might be challenging both in legal as well as ethical aspects in their experiments, studies and publications. IJHRMLP's ethical statements are based on 'Committee of Publication Ethics', (COPE).

1. ETHICAL EXPECTATIONS

Editors' Responsibilities

To act in a balanced, objective and fair way while carrying out their expected duties, without discrimination on grounds of gender, sexual orientation, religious or political beliefs, ethnic or geographical origin of the authors. Editor to handle all submissions for sponsored supplements or special issues in the same way as other submissions, so that articles are considered and accepted solely on their academic merit and without commercial influence at any point of time.

Complain on an ethical or conflict nature: To adopt and follow a reasonable procedures, in accordance with the policies and procedures of the IJHRMLP. To give authors a reasonable opportunity to respond to any of the complaints. All complaints shall be investigated no matter when the original publication was approved and published. Documentation associated with any such complaints should be retained.

Reviewers' Responsibilities

To contribute in all the decision-making procedures, and to assist accordingly to improve the quality of the papers to be published by reviewing the manuscript as per the guidelines of IJHRMLP, in a timely manner.

Reviewers to maintain the confidentiality of facts supplied by the editor or author. Reviewers are not to retain the copy the manuscript of the paper he or she reviewed.

Reviewers to alert the editor to any of the published or submitted content that is substantially similar to that under review.

Reviewers to be aware of any potential conflicts of interest (financial, institutional, collaborative or other relationships between the reviewer and author) and to alert the editor to these, if necessary withdrawing their services for that manuscript.

Authors' Responsibilities

The authors shall have to respect the International Committee of Medical Journal Editors (ICMJE) classifications on author. IJHRMLP follow the ICMJE recommendations with the following four criteria for the authorship.

1. Author must substantially contributes to the conception, designing of the work, acquisition, analysis, or interpretation of data related to the study.
2. Not only drafting of the work, but also revising it judgmentally for drawing scholarly content.
3. Have to approve the final version of the paper for publication and
4. Agreement to the accountability of all related aspects of the study in regards to integrity and accuracy of the topic investigated thereof and resolved.

Authors should maintain accurate records of all data associated with their submitted manuscript, and to supply or provide access to these data, on reasonable request as and when required. Where appropriate and where allowed by employer, funding body and others who might have an interest, to deposit data in a suitable repository or storage location, for sharing and further use by others.

Author needs to confirm that the manuscript has not submitted nor under consideration or accepted for publication elsewhere on submission to IJHRMLP portal. Where portions of the content overlap with published or submitted content, to acknowledge and cite those sources. Additionally, to provide the editor with a copy of any submitted manuscript that might contain overlapping or closely related content.

All the author have to confirm that all the work in the submitted manuscript is original and to acknowledge and cite content reproduced from other sources. To obtain permission to reproduce any content from other sources are required and to be submitted.

Authors should ensure that the studies involving human or animal subjects as research participant has the national/local/human institutional ethical clearance (HIEC) which ever applicable and required (e.g. WMA Declaration of Helsinki, NIH Policy on Use of Laboratory Animals, EU Directive on Use of Animals) and confirm that approval has been sought and obtained where appropriate. Authors should obtain informed consent from human subjects and respect their privacy and autonomy. In case of research papers on clinical drug test (CDT) the authors have to produce all the relevant paper documents as per ICMR guidelines, HIEC, Medical Council Regulation 2002 and others state, national and international ethical regulations.

Author to declare potential conflicts of interest, e.g., where the author has a competing interest (real or apparent) that could be considered or viewed as exerting an undue influence on his or her duties at any stage during the publication process).

Also to notify on time the journal editor/publisher if a significant error in their publication is identified. To cooperate

with the editor and publisher to publish an erratum, addendum, corrigendum notice, or to retract the paper, where this is deemed necessary as and when required.

Publisher or Society Responsibilities

Both IJHRMLP and the NECHURD on behalf of which it publishes shall ensure that good practices is maintained to the standards outlined above. More detailed ethical procedures will be set out and brought to the attention of journal editors and editorial boards.

As IJHRMLP is a society-owned journal, NECHURD will provide assurance that it will subscribe to the principles outlined above, or to substantially similar principles, either adopting these formally or producing their own for the attention of their editors and editorial boards.

2. PROCEDURES FOR DEALING WITH SCIENTIFIC MISCONDUCT

Identification of Scientific Misconduct

Scientific Misconduct and unethical behaviour may be identified and brought to the attention of the editor and publisher at any time, by anyone.

Whoever informs the editor or publisher of such conduct should provide sufficient information and evidence in order for an investigation to be initiated. All allegations should be taken seriously and treated in the same way, until a successful decision or conclusion is reached.

Investigation

An initial decision will be taken by the editor, who shall consult with or seek advice from the fellow editors and publisher, if think appropriate.

Evidence will be gathered, while avoiding spreading any allegations beyond those who need to know for establishing the fact.

Minor Breaches

Minor misconduct will be dealt with the author without the need to consult more widely. In any event, the author should be given sufficient time and opportunity to respond to any allegations against his publications.

Serious Breaches

In case of a serious scientific misconduct the employers of the alleged accused to be informed. The editor, in consultation with the publisher or Society as appropriate, will make a decision whether or not to involve the employers, either by examining the available evidence themselves or by further consultation with a limited number of the other experts. Any of the following penalties as mentioned in **Table 1** may be given in single or in conjunction to the so called accused.

Table 1 Panalties in increasing order of severity

SI No	PENALTY
1	Educating the author or reviewer where there appears to be a misinterpretation or misapplication of acceptable standards.
2	A more strongly worded letter to the author or reviewer covering the scientific misconduct with a warning of future behaviour of this kind.
3	Publication of a formal notice detailing the misconduct of the author.
4	Publication of an editorial detailing the misconduct of the author.
5	A formal letter to the head of the author's or reviewer's department or funding agency or employer.
6	Formal withdrawal of a publication from the journal, in conjunction with informing the head of the author or reviewer's department, Abstracting & Indexing services and the readership of the publication.
7	Imposition of a formal restriction on contributions from an individual for a defined period.
8	Reporting the incident and outcome to a professional organisation or higher authority for further investigation and action.



Inauguration of Souvenir at National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018



Inauguration of Vol:4, Issue:1 of IJHRMLP at National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018



Lifetime Achievement Awards Presented to Prof. (Dr.) Ajaya Mahanta and Dr. Santwaea Bardoloi at National CME of IJHRMLP ACADEMIC GROUP and VII Academic Event of IJHRMLP held on 27 January, 2018

Contact us
Email: editor@ijhrmlp.org
Website: www.ijhrmlp.org